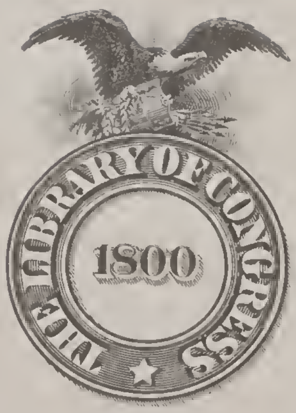

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THE NEW
IMPERIAL ENCYCLOPEDIA
AND
DICTIONARY

A LIBRARY OF UNIVERSAL KNOWLEDGE AND AN UNABRIDGED DICTIONARY OF THE ENGLISH LANGUAGE UNDER ONE ALPHABET

RICHARD GLEASON GREENE, A.M., Editor-in-Chief
(Formerly Editor-in-Chief of the International Cyclopedia)

Assisted by a large corps of trained
cyclopedists

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SCHEME OF SOUND SYMBOLS

FOR THE PRONUNCIATION OF WORDS.

Note.—(-) is the mark dividing words respelt phonetically into syllables: (′), the accent indicating on which syllable or syllables the accent or stress of the voice is to be placed.

Sound-symbols employed in Respelling.	Representing the Sounds as exemplified in the Words.	Words respelt with Sound-symbols and Marks for Pronunciation.
ā	mate, fate, fail, aye	*māt, fāt, fāl, ā.*
ă	mat, fat	*măt, făt.*
â	far, calm, father	*fâr, kâm, fâ'thėr.*
ä	care, fair	*cär, fär*
aw	fall, laud, law	*fawl, lawd, law.*
ē	mete, meat, feet, free	*mēt, mēt, fēt, frē.*
ĕ	met, bed	*mĕt, bĕd.*
ė	her, stir, heard, cur	*hėr, stėr, hėrd, kėr.*
ī	pine, ply, height	*pīn, plī, hīt.*
ĭ	pin, nymph, ability	*pĭn, nĭmf, ă-bĭl'ĭ-tĭ.*
ō	note, toll, soul	*nōt, tōl, sōl.*
ŏ	not, plot	*nŏt, plŏt.*
ô	move, smooth	*môv, smôth.*
ö	Goethe (similar to *e* in her)	*gö'tėh.*
ow	noun, bough, cow	*nown, bow, kow.*
oy	boy, boil	*boy, boyl.*
ū	pure, dew, few	*pūr, dū, fū.*
ŭ	bud, come, tough	*bŭd, kŭm, tŭf.*
û	full, push, good	*fûl, pûsh, gûd.*
ü	French plume, Scotch guid	*plüm, güd.*
ch	chair, match	*chär, măch.*
ċh	German buch, Heidelberg, Scotch loch (guttural)	*bôċh, hī'dĕl-bĕrċh, lŏċh.*
g	game, go, gun	*gām, gō, gŭn.*
j	judge, gem, gin	*jŭj, jĕm, jĭn.*
k	king, cat, cot, cut	*kĭng, kăt, kŏt, kŭt.*
s	sit, scene, cell, city, cypress	*sĭt, sēn, sĕl, sĭt'ĭ, sī'prĕs.*
sh	shun, ambition	*shŭn, ăm-bĭsh'ŭn.*
th	thing, breath	*thĭng, brĕth.*
th	though, breathe	*thō, brēth.*
z	zeal, maze muse	*zēl, māz, mūz.*
zh	azure, vision	*ăzh'ėr, vĭzh'ŭn.*

ABBREVIATIONS USED IN THIS WORK.

a., *or* adj	adjective
A.B	Bachelor of Arts
abbr	abbreviation, abbreviated
abl. *or* abla.	ablative
Abp	Archbishop
abt	about
Acad	Academy
acc. *or* ac.	accusative
accom	accommodated, accommodation
act	active
A.D.	in the year of our Lord [*Anno Domini*]
Adjt	Adjutant
Adm	Admiral
adv. *or* ad.	adverb
A. F	Anglo-French
Ag	Silver [*Argentum*]
agri	agriculture
A. L	Anglo-Latin
Al	Aluminium
Ala	Alabama
Alb	Albanian
alg	algebra
A.M.	before noon [*ante meridiem*]
A.M.	Master of Arts
Am	Amos
Amer	America, -n
anat	anatomy, anatomical
anc	ancient, anciently
AN. M.	in the year of the world [*Anno Mundi*
anon	anonymous
antiq	antiquity, antiquities
aor	aorist, -ic
app	appendix
appar	apparently
Apr	April
Ar	Arabic
arch	architecture
archæol	archæology
arith	arithmetic
Ariz	Arizona
Ark	Arkansas
art	article
artil	artillery
AS	Anglo-Saxon
As	Arsenic
Assoc	Association
asst	assistant
astrol	astrology
astron	astronomy
attrib	attributive
atty	attorney
at. wt	atomic weight
Au	Gold [*Aurum*]
A.U.C.	in the year of the building of the city (Rome) [*Anno urbis conditæ*]
Aug	August
aug	augmentative
Aust	Austrian
A. V.	authorized version [of Bible, 1611]
avoir	avoirdupois
B	Boron
B	Britannic
b	born
Ba	Barium
Bart	Baronet
Bav	Bavarian
bl.; bbl.	barrel; barrels
B.C.	before Christ
B.C.L.	Bachelor of Civil Law
B.D.	Bachelor of Divinity
bef	before
Belg	Belgic
Beng	Bengali
Bi	Bismuth
biog	biography, biographical
biol	biology
B.L.	Bachelor of Laws
Bohem	Bohemian
bot	botany, botanical
Bp	Bishop
Br	Bromine
Braz	Brazilian
Bret	Breton
Brig	Brigadier
Brit	British, Britannica
bro	brother
Bulg	Bulgarian
bush	bushel, bushels
C	Carbon
c	century
Ca	Calcium
Cal.	California
Camb	Cambridge
Can	Canada
Cant	Canterbury
cap	capital
Capt	Captain
Card	Cardinal
carp	carpentry
Cath	Catholic
caus	causative
cav	cavalry
Cd	Cadmium
Ce	Cerium
Celt	Celtic
cent	central
cf	compare [*confer*]
ch *or* chh.	church

Chal	Chaldee
chap	chapter
chem	chemistry, chemical
Chin	Chinese
Chron	Chronicles
chron	chronology
Cl	Chlorine
Class	Classical [= Greek and Latin]
Co	Cobalt
Co	Company
co	county
cog	cognate [with]
Col	Colonel
Col	Colossians
Coll	College
colloq	colloquial
Colo	Colorado
Com	Commodore
com	commerce, commercial
com	common
comp	compare
comp	composition, compound
compar	comparative
conch	conchology
cong	congress
Congl	Congregational
conj	conjunction
Conn *or* Ct.	Connecticut
contr	contraction, contracted
Cop	Coptic
Cor	Corinthians
Corn	Cornish
corr	corresponding
Cr	Chromium
crystal	crystallography
Cs	Cæsium
ct	cent
Ct. *or* Conn.	Connecticut
Cu	Copper [*Cuprum*]
cwt	a hundred weight
Cyc	Cyclopedia
D	Didymium
D. *or* Dut.	Dutch
d	died
d. [l. s. d.]	penny, pence
Dan	Daniel
Dan	Danish
dat	dative
dau	daughter
D. C.	District of Columbia
D.C.L.	Doctor of Civil [or Common] Law
D.D.	Doctor of Divinity
Dec	December
dec	declension
def	definite, definition
deg	degree, degrees
Del	Delaware
del	delegate, delegates
dem	democratic
dep	deputy
dep	deponent
dept	department
deriv	derivation, derivative
Deut	Deuteronomy
dial	dialect, dialectal
diam	diameter
Dic	Dictionary
diff	different, difference
dim	diminutive
dist	district
distrib	distributive
div	division
doz	dozen
Dr	Doctor
dr	dram, drams
dram	dramatic
Dut. *or* D.	Dutch
dwt	pennyweight
dynam *or* dyn	dynamics
E	Erbium
E. *or* e	East, -ern, -ward
E. *or* Eng.	English
Eccl	Ecclesiastes
eccl. *or* eccles	ecclesiastical [affairs]
ed	edited, edition, editor
e.g	for example [*ex gratia*]
E. Ind. *or* E. I.	East Indies, East Indian
elect	electricity
Emp	Emperor
Encyc	Encyclopedia
Eng. *or* E.	English
engin	engineering
entom	entomology
env. ext.	envoy extraordinary
ep	epistle
Eph	Ephesians
Episc	Episcopal
eq. *or* =	equal, equals
equiv	equivalent
esp	especially
Est	Esther
estab	established
Esthon	Esthonian
etc	and others like [*et cetera*]
Eth	Ethiopic
ethnog	ethnography
ethnol	ethnology
et seq	and the following [*et sequentia*]
etym	etymology
Eur	European
Ex	Exodus
exclam	exclamation
Ezek	Ezekiel
Ezr	Ezra
F	Fluorine
F. *or* Fahr.	Fahrenheit
f. *or* fem	feminine
F. *or* Fr.	French
fa	father
Fahr. *or* F.	Fahrenheit
far	farriery
Fe	Iron [*Ferrum*]
Feb	February
fem *or* f.	feminine
fig	figure, figuratively
Fin	Finnish
F.—L.	French from Latin
Fla	Florida
Flem	Flemish
for	foreign
fort	fortification
Fr. *or* F.	French
fr	from

ABBREVIATIONS.

freq	frequentative
Fris	Frisian
ft	foot, feet
fut	future
G. *or* Ger	German
G	Glucinium
Ga	Gallium
Ga	Georgia
Gael	Gaelic
Gal	Galatians
gal	gallon
galv	galvanism, galvanic
gard	gardening
gen	gender
Gen	General
Gen	Genesis
gen	genitive
Geno	Genoese
geog	geography
geol	geology
geom	geometry
Ger	German, Germany
Goth	Gothic
Gov	Governor
govt	government
Gr	Grand, Great
Gr	Greek
gr	grain, grains
gram	grammar
Gr. Brit	Great Britain
Gris	Grisons
gun	gunnery
H	Hegira
H	Hydrogen
h	hour, hours
Hab	Habakkuk
Hag	Haggai
H. B. M.	His [or Her] Britannic Majesty
Heb	Hebrew, Hebrews
her	heraldry
herpet	herpetology
Hg	Mercury [*Hydrargyrum*]
hhd	hogshead, hogsheads
Hind	Hindustani, Hindu, or Hindi
hist	history, historical
Hon	Honorable
hort	horticulture
Hos	Hosea
Hung	Hungarian
Hydros	Hydrostatics
I	Iodine
I.; Is	Island ; Islands
Icel	Icelandic
ichth	ichthyology
Ida	Idaho
i.e.	that is [*id est*]
Ill	Illinois
illus	illustration
impera *or* impr	imperative
impers	impersonal
impf *or* imp	imperfect
impf. p. *or* imp	imperfect participle
improp	improperly
In	Indium
in	inch, inches
incept	inceptive
Ind	India, Indian
Ind	**Indiana**
ind	indicative
indef	indefinite
Indo-Eur	Indo-European
inf	infantry
inf *or* infin	infinitive
instr	instrument, -al
int	interest
intens	intensive
interj. *or* int	interjection
interrog	interrogative pronoun
intr. *or* intrans	intransitive
Io	Iowa
Ir	Iridium
Ir	Irish
Iran	Iranian
irr	irregular, -ly
Is	Isaiah
It	Italian
Jan	January
Jap	Japanese
Jas	James
Jer	Jeremiah
Jn	John
Josh	Joshua
Jr	Junior
Judg	Judges
K	Potassium [*Kalium*]
K	Kings [in Bible]
K	king
Kan	Kansas
Kt	Knight
Ky	Kentucky
L	Latin
L	Lithium
l. [l. s. d.], *or* £	pound, pounds [sterling]
La	Lanthanium
La	Louisiana
Lam	Lamentations
Lang	Languedoc
lang	language
Lap	Lapland
lat	latitude
lb.; llb. *or* lbs	pound ; pounds [weight]
Let	Lettish
Lev	Leviticus
LG	Low German
L.H.D	Doctor of Polite Literature
Lieut	Lieutenant
Lim	Limousin
Lin	Linnæus, Linnæan
lit	literal,-ly
lit	literature
Lith	Lithuanian
lithog	lithograph, -y
LL	Late Latin, Low Latin
LL.D	Doctor of Laws
long	longitude
Luth	Lutheran
M	Middle
M	Monsieur
m	mile, miles
m. *or* masc	masculine
M.A	Master of Arts
Macc	Maccabees
mach	machinery
Mag	Magazine

Maj	Major
Mal	Malachi
Mal	Malay, Malayan
manuf	manufacturing, manufacturers
Mar	March
masc *or* m.	masculine
Mass	Massachusetts
math	mathematics, mathematical
Matt	Matthew
M.D.	Doctor of Medicine
MD	Middle Dutch
Md	Maryland
ME	Middle English, or Old English
Me	Maine
mech	mechanics, mechanical
med	medicine, medical
mem	member
mensur	mensuration
Messrs. *or* MM	Gentlemen, Sirs
metal	metallurgy
metaph	metaphysics, metaphysical
meteor	meteorology
Meth	Methodist
Mex	Mexican
Mg	Magnesium
M.Gr	Middle Greek
MHG	Middle High German
Mic	Micah
Mich	Michigan
mid	middle [voice]
Milan	Milanese
mid. L. *or* ML.	Middle Latin, Mediæval Latin
milit. *or* mil.	military [affairs]
min	minute, minutes
mineral	mineralogy
Minn	Minnesota
Min. Plen.	Minister Plenipotentiary
Miss	Mississippi
ML. *or* mid. L.	Middle Latin, Mediæval Latin
MLG	Middle Low German.
Mlle	Mademoiselle
Mme	Madam
Mn	Manganese
Mo	Missouri
Mo	Molybdenum
mod	modern
Mont	Montana
Mr	Master [Mister]
Mrs	Mistress [Missis]
MS.; MSS.	manuscript; manuscripts
Mt	Mount, mountain
mus	music
MUS. DOC.	Doctor of Music
myth	mythology, mythological
N.	Nitrogen
N. *or* n.	North, -ern, -ward
n	noun
n *or* neut.	neuter
Na	Sodium [*Natrium*]
Nah	Nahum
N. A., *or* N. Amer.	North America, -n
nat	natural
naut	nautical
nav	navigation, naval affairs
Nb	Niobium
N. C. *or* N. Car.	North Carolina
N. D	North Dakota
Neb	Nebraska
neg	negative
Neh	Nehemiah
N. Eng.	New England
neut *or* n.	neuter
Nev	Nevada
N.Gr.	New Greek, Modern Greek
N. H	New Hampshire
NHG	New High German [German]
Ni	Nickel
N. J	New Jersey
NL	New Latin, Modern Latin
N. Mex.	New Mexico
N. T., *or* N. Test.	New Testament
N. Y.	New York [State]
nom	nominative
Norm. F.	Norman French
North. E.	Northern English
Norw.	Norwegian, Norse
Nov	November
Num	Numbers
numis	numismatics
O	Ohio
O	Old
O	Oxygen
Obad	Obadiah
obj	objective
obs. *or* †	obsolete
obsoles	obsolescent
O.Bulg	Old Bulgarian or Old Slavic
Oct	October
Odontog.	odontography
OE	Old English
OF *or* O. Fr.	Old French
OHG	Old High German
Ont	Ontario
opt	optics, optical
Or	Oregon
ord	order
ord	ordnance
org	organic
orig	original, -ly
ornith	ornithology
Os	Osmium
OS.	Old Saxon
O. T., *or* O. Test.	Old Testament
Oxf	Oxford
oz	ounce, ounces
P	Phosphorus
p.; pp	page; pages
p., *or* part.	participle
Pa. *or* Penn.	Pennsylvania
paint	painting
palæon	palæontology
parl	parliament
pass	passive

ABBREVIATIONS.

pathol *or* path	pathology
Pb	Lead [*Plumbum*]
Pd	Palladium
Penn *or* Pa.	Pennsylvania
perf	perfect
perh	perhaps
Pers	Persian, Persic
pers	person
persp	perspective
pert	pertaining [to]
Pet	Peter
Pg. *or* Port.	Portuguese
phar	pharmacy
PH.D	Doctor of Philosophy
Phen	Phenician
Phil	Philippians
Philem	Philemon
philol	philology, philological
philos. *or* phil	philosophy, philosophical
phonog	phonography
photog	photography
phren	phrenology
phys	physics, physical
physiol	physiology, physiological
Pied	Piedmontese
Pl	Plate
pl. *or* plu	plural
Pl. D	Platt Deutsch
plupf	pluperfect
P.M	afternoon [*post meridiem*]
pneum	pneumatics
P. O	Post-office
poet	poetical
Pol	Polish
pol econ	political economy
polit	politics, political
pop	population
Port. *or* Pg.	Portuguese
poss	possessive
pp	pages
pp	past participle, perfect participle
p. pr	present participle
Pr. *or* Prov.	Provençal
pref	prefix
prep	preposition
Pres	President
pres	present
Presb	Presbyterian
pret	preterit
prim	primitive
priv	privative
prob	probably, probable
Prof	Professor
pron	pronoun
pron	pronunciation, pronounced
prop	properly
pros	prosody
Prot	Protestant
Prov. *or* Pr.	Provençal
Prov	Proverbs
prov	province, provincial
Prov. Eng.	Provincial English
Prus	Prussia, -n
Ps	Psalm, Psalms
psychol	psychology
pt	past tense
pt	pint
Pt	Platinum
pub	published, publisher, publication
pwt	pennyweight
Q	Quebec
qt	quart
qtr	quarter [weight]
qu	query
q.v.	which see [*quod vide*]
R	Rhodium
R	River
Rb.	Rubidium
R. Cath	Roman Catholic
rec. sec	recording secretary
Ref	Reformed
refl	reflex
reg	regular, -ly
regt	regiment
rel. pro. *or* rel	relative pronoun
repr	representing
repub	republican
Rev	Revelation
Rev	The Reverend
Rev. V	Revised Version
rhet	rhetoric, -al
R. I	Rhode Island
R. N	Royal Navy
Rom	Roman, Romans
Rom	Romanic or Romance
Rom. Cath. Ch. *or* R. C. Ch	Roman Catholic Church
r.r.	railroad
Rt. Rev	Right Reverend
Ru	Ruthenium
Russ	Russian
r.w.	railway
S	Saxon
S	Sulphur
s	second, seconds
s. [l. s. d.]	shilling, shillings
S. *or* s	South, -ern, -ward
S. A. *or* S. Amer.	South America, -n
Sam	Samaritan
Sam	Samuel
Sans, *or* Skr	Sanskrit
Sb	Antimony [*Stibium*]
s.c	understand, supply, namely [*scilicet*]
S. C. *or* S. Car	South Carolina
Scand	Scandinavian
Scot	Scotland, Scotch
scr	scruple, scruples
Scrip	Scripture [s], Scriptural
sculp	sculpture
S. D	South Dakota
Se	Selenium
sec	secretary
sec	section
Sem	Semitic
Sep	September
Serv	Servian
Shaks	Shakespeare
Si	Silicon

ABBREVIATIONS.

Sic	Sicilian
sing	singular
sis	sister
Skr. *or* Sans	Sanskirt
Slav	Slavonic, Slavic
Sn	Tin [*Stannum*]
Soc	Society
Song Sol	Song of Solomon
Sp	Spanish
sp. gr	specific gravity
sq	square
Sr	Senior
Sr	Strontium
St., Ste.	Saint
St.	street
stat	statute
S.T.D	Doctor of Sacred Theology
subj	subjunctive
suf	suffix
Su. Goth	Suo-Gothic
superl	superlative
Supp	Supplement
Supt	Superintendent
surg	surgery, surgical
Surv	surveying
Sw	Swedish
Swab	Swabian
sym	symbol
syn	synonym, -y
Syr	Syriac, Syrian
t	town
Ta	Tantalum
Tart	Tartar
Te	Tellurium
technol	technology
teleg	telegraphy
Tenn	Tennessee
term	termination
terr	territory
Teut	Teutonic
Tex	Texas
Th	Thorium
theat	theatrical
theol	theology, theological
therap	therapeutics
Thess	Thessalonians
Ti	Titanium
Tim	Timothy
Tit	Titus
Tl	Thallium
toxicol	toxicology
tp	township
tr. *or* trans.	transitive
transl	translation, translated
trigon	trigonometry
Turk	Turkish
typog	typography, typographical
U	Uranium
ult	ultimate, -ly
Unit	Unitarian
Univ	Universalist
Univ	University
U. Presb	United Presbyterian
U. S.	United States
U. S. A.	United States Army
U. S. N.	United States Navy
Ut	Utah
V	Vanadium
v	verb
Va	Virginia
var	variant [word]
var	variety of [species]
Ven	Venerable
Venet	Venetian
vet	veterinary
v. i. *or* v. intr	verb intransitive
vil	village
viz	namely, to-wit [*videlicet*]
v. n	verb neuter
voc	vocative
vol	volume
vols	volunteers
Vt	Vermont
v. tr	verb transitive
W	Tungsten [*Wolfram*]
W	Welsh
W. *or* w	West, -ern, -ward
Wal	Walachian
Wall	Walloon
Wash	Washington
Westph	Westphalia, -n
W. Ind. *or* W. I.	West Indies, West Indian
Wis	Wisconsin
wt	weight
W. Va	West Virginia
Wyo	Wyoming
Y	Yttrium
yd	yard
yr	year
Zech	Zechariah
Zeph	Zephaniah
Zn	Zinc
zool	zoology, zoological
Zr	Zirconium

See also ABBREVIATIONS in Vol. I.

IMPERIAL ENCYCLOPEDIA AND DICTIONARY.

SECRETARY, n. *sĕk'rĕ-tā-rĭ* [F. *secrétaire;* It. *secretario*, a secretary—from mid. L. *secretārĭus*, a confidential officer—from L. *secrētus*, secret (see Secret)]: a confidential person employed to assist another in conducting correspondence, in drawing out documents, etc.; the head clerk of a man of business, or of a public company: minister of state intrusted with the management of a particular department of public business (see various titles—Secretary, etc.—below). Sec'retaryship, n. *-shĭp*, office of a secretary. Secretaire, n. *sĕk-rĕ-tär'* [F. *secrétaire*]: kind of writing-table fitted with pigeon-holes, drawers, etc.

SEC'RETARY, or Secretary Fal'con, or Secretary Bird, or Ser'pent-eater (*Gypogeranus*): genus of birds of prey, variously placed by naturalists among the *Falconidæ* and the *Vulturidæ;* also by some constituted into a distinct family, *Gypogeranidæ.* The legs are very long, as in the *Grallæ*, to which, however, there is no other resemblance. The *tibiæ* are completely feathered, but the *tarsi* and toes are destitute of feathers. The tarsi are covered in front with long, large scales. The toes are armed with sharp claws; but they are short, and the feet are not formed for grasping. The hind-toe is very short. The neck is much longer, and the whole form of the bird more slender than in the Falconidæ. The wings are long, and armed with a blunt spur at the shoulder. The tail is very long. The best-known species is an inhabitant of the arid plains of s. Africa. It is about three ft. in length; plumage bluish-gray. It has an occipital crest of feathers without barbs at the base, which can be raised or depressed at pleasure, and the name Secretary was given to it by the colonists at the Cape of Good Hope from their fancied resemblance to pens stuck behind the ear. It feeds chiefly on reptiles of all kinds, which it devours in great numbers. The S. is often tamed as a protector of poultry-yards; but if not sufficiently fed, is apt to help itself to a chicken or duckling. An attempt has been made to introduce this bird into Martinique, in order to reduce the number of venomous serpents in that island.—Another species appears to exist in more n. parts of Africa, as about the **Gambia;**

Secretary Bird (*Serpentarius secretarius*).

and a third, more widely different, in the Philippine Islands.

SECRETARY-AT-WAR: formerly a high officer of the Brit. ministry, in control of the financial arrangements of the army, and the responsible medium for parliamentary supervision in military affairs. During the Russian war, the evils of divided authority led to the creation of a Sec. of State for War (see SECRETARY OF STATE) to control all the military departments, in whose superior office the secretaryship-at-war was merged 1855; and 1863 the former office was formally abolished.—See SECRETARIES OF EXECUTIVE DEPARTMENTS, in the U. S. Government.

SECRETARY OF LEGATION: principal of the persons belonging to the suite of an ambassador or envoy. A S. of L. is appointed by the sovereign power or executive head of the state, and is a species of public minister, being the trusted assistant of his chief, and having under the law of nations the same immunities as an ambassador or envoy. During the absence of the minister plenipotentiary or envoy the S. of L. discharges his duties.

A sec. of embassy or legation must not be confounded with the private sec. of an ambassador appointed and paid by him, who has none of the privileges and immunities above mentioned.

SECRETARY OF STATE: in the Eng. govt., an ancient and important office, concerned in direction of home and foreign affairs. The oldest record of its existence is in the reign of Henry III. 'secretarius noster.' Prior to the Restoration, the holder of this office was generally styled the 'king's chief' or 'principal secretary.' Two secretaries were appointed in later times.

There are now five principal secretaries of state, respectively appointed for home affairs, foreign affairs, war, the colonies, and India. They all are appointed by the sovereign, and are always members of the privy council and of the cabinet. Though each has his own department, he is considered capable of discharging the duties of the others.—The Sec. of State for the Home Department has charge of maintenance of the internal peace and the administration of justice, so far as the royal prerogative is involved. He directs the disposal and employment of the regular and other troops at home, and provides for suppression of riots. He has ultimate supervision of prisons and criminals; and statutory powers regarding police, sanitary matters, regulation of labor, etc. All patents, licenses, dispensations. charters of incorporation, commissions of the peace and of inquiry, pass through his office; and he is empowered to grant certificates of Naturalization (q.v.) to foreigners. He is the organ of communication between the cabinet and the viceregal govt. of Ireland. His patronage is considerable, including nomination to a large number of judicial offices.—The Sec. of State for Foreign Affairs is the responsible adviser of the crown in all communications between the govt. and foreign powers. He negotiates treaties, either directly with the foreign ministers resident in the country, or through the British ministers abroad. He grants Passports (q.v.); and it is his duty to inquire into the complaints of British subjects residing in foreign countries, to afford them protection, and to demand redress for their grievances. He recommends to the sovereign all ambassadors, ministers, and consuls.—The Sec. for the Colonial Dept. has supervision of the laws and customs of the colonies, directs their government, apportions the troops necessary for their defense or police, appoints the governors of the colonies; and sanctions or disallows the measures of the colonial governments, rarely, however, prescribing measures for their adoption.—The Sec. of State for India has control over the govt. of India, and countersigns all warrants and orders relating to India. He is assisted by under-secretaries, etc., also by a council of 15 members.—There is also a Chief Sec. for Ireland, resident in Dublin, except during the sitting of parliament, and under the authority of the lord-lieutenant. The Sec of State for War (see SECRETARY-AT-WAR) has superintendence of all matters connected with the army, assisted by the commander-in-chief, and is responsible for the amount of the military establishment.

See SECRETARIES OF EXECUTIVE DEPARTMENTS, in the U. S. Government.

SECRETARY OF THE NAVY: in Britain, conventional title of the parliamentary sec. to the Board of Admiralty, a ministerial supporter in the house of commons, usually the exponent of naval policy. He changes with the ministry, of which he is a subordinate member. There is also a permanent sec., who holds office for life, responsible for the discipline of the Admiralty Office.—See Secretaries of Executive Departments, in the U. S. Government.

SECRETARY OF THE SENATE: official, elected by the U. S. senate, who keeps the journal of the senate, communicates to the pres. and to the other house of congress messages from the senate, and performs other functions of a secretary.

SECRETE, v. *sĕ-krēt′* [F. *sécréter*, to secrete: L. *secrētus*, severed, separated (see Secret)]: to conceal; to remove from observation, or from the knowledge of others; in *animals*, to separate or produce from the blood, or its constituents, substances different from the blood itself; in *plants*, to separate substances from the sap. Secre′ting, imp. Secre′ted, pp. Secretion, n. *sĕ-krē′shŭn* [F.—L.]: the process by which substances are separated from the blood or its constituents, different from the blood itself, as saliva, bile, urine, etc.; one of the substances thus separated (see below). Secretitious, a. *sē′krĕ-tĭsh′ŭs*, formed by secretion. Secretive, a. *sĕ-krē′tĭv*, causing secretion; inducing secrecy or concealment. Secre′tively, ad. *-lĭ*. Secre′tiveness, n. *-nĕs*, the quality of being secretive; in *phren.*, the quality of that organ whose large development is said to impel the individual toward secrecy or concealment. Secretory, a. *sĕ-krē′tō-rĭ*, performing the office of secretion.—Syn. of ‘secrete’: to hide; conceal; cover; screen; shelter; separate.

SECRE′TION, in Physiology: process of *separation* from the nutritious fluids of the body of those matters destined not to be directly applied to nutrition and renovation of its organized fabric, but (1) to be either at once removed as injurious to its welfare, or (2) to be employed for some ulterior purpose in the chemical or physical processes of the economy itself, or to exert some kind of action upon other beings. The term is also commonly used in another sense—to designate the *products* thus secreted: in this latter sense, it is customary to speak of the biliary, urinary, or cutaneous secretion, when the bile, urine, and sweat are indicated.

Although it is impossible to divide with strictness the secreted products (as many physiologists have attempted to do) into the *excrementitious* and the *recrementitious*—that is to say, into (1) those which have no further function to discharge in the animal body, and which, if not excreted, would act as poisons, and (2) those which are subservient to further uses in the system—yet we may group them according to the preponderance of their excrementitious or recrementitious character. Dr. Carpenter approves of this arrangement, and proposes that those secretory processes should be arranged in the first division in which the depuration of the blood is obviously the chief end, while those should be classed under the second in which the ulterior purpose of the separated fluid would seem to be the principal occasion of its production; and he further suggests a subdivision of this second group, according as this ulterior purpose is connected with the operations of the economy itself, as in the case of the tears, the saliva, the gastric juice, etc., or is destined to act on some other organism, as is the case with the secretion of the testes, the milk, etc. The organs which yield the various secretions are termed Glands (q.v.); but neither the form nor the internal arrangement of the parts of a gland have any essential connection with the nature of its product; the true process of S., under whatever form, being performed always by the intervention of Cells (q.v.). For a notice of the mode in which the cells are arranged in various glandular structures, see GLAND: LIVER: KIDNEY: MUCOUS MEMBRANE: ETC.

We briefly notice the causes which render due performance of the functions of S. essential to the well-being of an animal. 1. Nearly all the solids and fluids of the body are liable to continuous decomposition and decay in consequence of their peculiar chemical composition; there is obvious necessity that the products of incipient decomposition should be carried off, and replaced by newly-organized matter. 2. The exercise of the various animal functions is essentially destructive to the structures by which they are accomplished; every operation of the muscular or nervous system appearing to require, as a necessary condition, a disintegration or breaking up of a certain portion of their tissues, probably by an act of oxidation: hence, for due preservation of health, the disintegrated or effete matters must be removed, and their place supplied. 3. When more food is taken than the wants of the system require, all that is not appropriated to the reparation of the waste, or to the increase in the weight of the body, must be thrown off by the excretory organs without ever having become converted into organic tissue: if this excess were not speedily removed by the excretory organs, the current of the blood would speedily become poisoned.

The following is an approximately complete list of the substances produced within the organisms of man and the lower animals by disintegration of the various tissues, and which are found in one or other of the products of S.: 1. Products of secreting processes: including—*a*, the biliary acids and the products of their disintegration; *b*, the pigments of the bile; *c*, pigments allied to those of the bile and blood—viz., hæmatoidin and melanin; *d*, cholesterin and its allies; *e*, the sugars and allied bodies. 2. Products of the actual regressive metamorphosis of tissues—*a*, nitrogenous amide-like bodies, e.g., leucine, tyrosine, creatine, creatinine, allantoin, cystin, guanine, sarcine, xanthin, and urea; *b*, nitrogenous acids, e.g., hippuric, uric, and cynuric acids; *c*, indifferent nitrogenous bodies, e.g., the pigments occurring in the urine, and excretine; and *d*, non-nitrogenous acids, e.g., acetic, benzoic, butyric, carbonic, formic, lactic, oxalic, succinic, and valerianic acids. Some of these products, however, occur in the secretions in cases only of disease.

SECRETIONS, VEGETABLE: any substances formed by action of cells on the compounds taken up as food (such as carbonic acid, water, and ammonia)—whether these substances form part of the tissue of the plant, or are thrown out upon its surface. Thus the term *secretion* has a wider application in the vegetable than in the animal kingdom. All the important vegetable secretions are compounds of carbon, hydrogen, oxygen, and nitrogen; sulphur also being present in some cases; and according to their functions they may be classed in two great divisions—(1) nutritive or assimilable secretions; (2) non-assimilable or special secretions.

1. The *nutritive* secretions are those substances which, having been formed within the plant, are used in forming its structures and constructing its general mass. The chief substances in this class are cellulose, the varieties of starch, the varieties of sugar, the oils, and the so-called protein or albuminous bodies. The composition of these substances is extremely varied; thus, many of the volatile oils or essences contain only carbon and hydrogen; the sugars, starches, and cullulose contain carbon, hydrogen, and oxygen, and are named ternary compounds; while the protein bodies contain carbon, hydrogen, oxygen, and nitrogen, and, in some cases, sulphur.

2. The *non-assimilable* secretions are found only in certain parts of the plant, and are named from their never being converted into the nutritive secretions. The principal members of this class are the coloring matter of plants (chlorophyl and its modifications); the substances which, when extracted from plants, are of service as dye-stuffs (the *chromogens* or color-formers of recent chemists); the organic acids—a somewhat numerous group, of which oxalic acid (occurring in rhubarb, sorrel, etc.), tartaric and racemic acids (in the grape), malic acid (in the apple and gooseberry), citric acid (in the orange, lemon, lime, and red currant), gallic acid (in the seeds of the mango), meconic acid (in the opium poppy), and tannic acid (in the bark of the oak, elm, etc.), are examples; the vegetable alkalies or alkaloids, e.g., morphia, strychnia, quinia, etc.; the volatile oils; and the resins.

SECRET SERVICE, under the U. S. Government, a dept. conducted by detective officers who watch for counterfeiters, parties endeavoring to evade the revenue laws, and people secretly plotting against the peace and welfare of society. Though not directly established by law, the S. S. is well organized and is very efficient. The chief receives a salary of about $3,000 per year, and is under control of the solicitor of the treasury. During the civil war a S. S. force was employed by the war dept. The chief of the bureau had the rank of brig. gen. of volunteers.

SECRET WRITING—SYMPATHETIC INK: see INK.

SECROLE, *sē-krōl':* small town of Brit. India, N. W. Provinces, 3 m. n.w. of Benares; containing most of the civil establishments, the military cantonments, and the residences of most of the Brit. population connected with Benares. The residences or bungalows are handsome and substantial, but are scattered about among the groves and gardens surrounding the military cantonments, which have capacity for three or four regiments. Among public buildings are a Christian church and chapel, a court of justice, the treasury, the jail, and a mint.

SECT, n. *sĕkt* [F. *secte,* a sect—from mid. L. *secta,* a following, a suite: L. *secta,* a party, a faction—from *sequi,* to follow: It. *setta,* a following]: a number of persons who, following a teacher or leader, are united by their attachment to some particular doctrines or tenets, usually in religion or philosophy; a body of persons dissenting from an established church. SECTARIAN, a. *sĕk-tā'rĭ-ăn,* pertaining to or peculiar to a sect: N. one of a sect; a dissenter. SECTA'RIANIZE, v. *-īz,* to imbue with sectarian principles or feelings. SECTA'RIANIZING, imp. SECTA'RIANIZED, pp. *-īzd.* SECTA'RIANISM, n. *-ĭzm,* dissent from an established church. SEC'TARY, n. *-tėr-ĭ,* one who dissents from an established church.—SYN. of 'sectarian, n.': dissenter; heretic; schismatic; partizan.

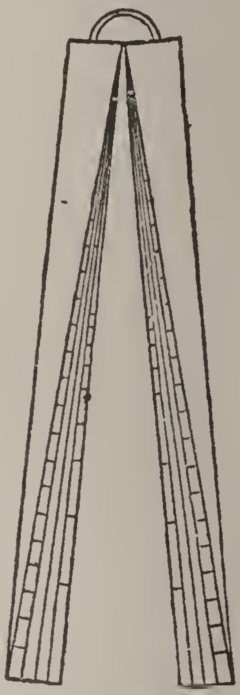
SECT, n. *sĕkt* [L. *sectus,* cut, divided—from *secārĕ,* to cut]: in *gard.,* a cutting; in *OE.,* a slip or scion.

SECTILE, a. *sĕk'tĭl* [L. *sectĭlĭs,* that may be cut—from *seco,* I cut]: that may be sliced, as with a knife—applied to such rocks and minerals as talc, mica, and steatite, which can be cut without breaking or crumbling.

SECTION, n. *sĕk'shŭn* [F. *section*—from L. *sectĭō* or *sectĭōnem,* a cutting; *sectus,* cut—from *seco,* I cut]: act of cutting; a part separated from the rest; a distinct part or portion; a division, as of a book, a country, etc.; a paragraph: in *arch.* (see below): in *geom.,* the line formed by the intersection of two surfaces; the surface formed when a solid body is cut by a plane; in the *United States,* a tract of land of one square mile. SEC'TIONAL, a. *-ăl,* pertaining to a section or distinct part; made up of several distinct parts. SEC'TIONALLY, ad. *-lĭ.* SEC'TOR, n. *-tėr, literally,* that which cuts or divides: in *geom.,* the part of a circle between two radii and the intercepted arc of the circumference. Its area is equal to that of a triangle whose base is equal in length to the intercepted arc, and whose perpendicular height is equal to the length of the radius. Sector, in *practical mechanics* (see below). SEC'TORAL, a. of or pertaining to a sector. SECTOR OF A CIRCLE, a part of a circle bounded by two radii and the arc between their extremities. DIP SECTOR, an instrument used for measuring the dip of the horizon.

SEC'TION, in Architecture: delineation of buildings on a vertical plane (as it were, *sliced* down) through any part of them—as a *plan* is the horizontal projection. Sections show thickness of walls, construction of floors, roofs, etc., and forms and dimensions of every part of the interiors of buildings. They may be used to show also the furniture, drapery, etc., of rooms; these are called furnished sections. All moldings, cornices, etc., are drawn in section or profile, full size, for guidance of the workmen.

SEC'TOR, in Practical Mechanics: mathematical instrument in rough mathematical drawing, for laying down plans, calculating zenith distances, etc. It consists of two strips of wood, ivory, or metal, jointed together like a carpenter's foot-rule. It is absolutely necessary for the correctness of the instrument that the centre of the axle of the joint should be accurately at the inner corner of each slip (as shown in the figure), so that it will always be the vertex of a triangle of which the inner edges (and consequently any of the corresponding pairs of lines drawn from the joint obliquely along the rule) form the two sides. These oblique lines, drawn on both sides of the instrument, and converging from the extremities of the two strips to the centre of the joint, are graduated in different ways, to give, on each limb, a line of equal parts, a scale of chords, scales of sines, tangents, and secants, a line of polygons, etc. (all of which are graduated from the centre of the hinge, which is their zero point), besides a number of common scales on the blank portions of the sector. The special use of this instrument is in the finding of a fourth proportional to three given quantities, and the operation is as follows: If the fourth proportional to 18, 16, and 81 is required, find the graduation indicating 18 on each limb; then obtain by means of a pair of compasses, the length from 0 to 16, and open out the instrument till the two 18 points are as far apart as the distance given by the compasses; then, by measuring with the compasses the distance of the two graduations indicating 81, and applying the compasses to the scale, is obtained the fourth proportional required. Thus this instrument merely supplies a mechanical mode of constructing two similar isosceles triangles, one of which has all its sides, and the other has only its equal sides, given; the other side or base, which is formed by the sector, and read off by aid of the compasses and scale, being, from the very nature of similar triangles, the fourth proportion required. The instrument becomes more inaccurate as the angle formed by the limbs increases. It is said to have been invented by Guido Ubaldi about 1568, though Gaspar Mordente of Antwerp describing it, 1584, attributes its invention to his brother Fabricius, 1554. It was described by several German and English writers in the same century, and again by Galileo, who claimed to have invented it 1604.


Sector.

SECTORIAL, a. *sĕk-tō'rĭ-ăl* [L. *sectus*, cut; *secārĕ*, to cut]: adapted for cutting—said of certain of the teeth.

SECULAR, a. *sĕk'ū-lėr* [F. *séculaire*, secular—from L. *secularis*, of or belonging to a generation—from *seculum*, a generation, a hundred years: It. *secolare*]: pertaining to things of the present world; temporal; worldly; in *Rom. Cath. Chh.*, not bound by monastic vows—applied to certain of the clergy, 'secular clergy,' as distinguished from the *regulars*, i.e., the monastic clergy (see CLERGY): in *geol.*, applied to great natural processes, whose results become appreciable only after the lapse of ages; happening or coming once in a century: N. in *OE.*, a layman. SEC'ULARIST, n. *-ĭst*, one who discards all forms of religious worship and religious belief, and directs his attention solely to the objects of this life; one who objects to the introduction of a religious element into scholastic or civil life. SEC'ULARLY, ad. *-lĭ*. SEC'ULARNESS, n. *-nĕs*, the quality of being secular. SEC'ULAR'ITY, n. *-lăr'ĭ-tĭ*, worldliness; attention to the things of the present life. SECULAR EQUATION, in *astron.*, the numerical expression of the magnitude and period of a secular inequality. SECULAR GAMES, in *anc. Rome*, games celebrated once in each *seculum*—that is, every 100 or 110 years. SECULAR INEQUALITY, in *astron.*, any deviation from the mean motion or mean orbit of a celestial body. SECULAR REFRIGERATION, in *geol.*, the periodical cooling, and consequent consolidation, of the crust of the globe. SEC'ULARIZE, v. *-lėr-īz*, to convert from spiritual purposes to common use; to render secular; to convert the regular or monastic into the secular. SEC'ULARIZING, imp. SEC'ULARIZED, pp. *-īzd*. SEC'ULARIZA'TION, n. *-ĭ-zā'shŭn* [F.—L.]: the act of converting ecclesiastical property into secular.

SEC'ULARISM: system of ethical principles whose advocacy began in England, about 1846, by George Jacob Holyoake (q.v.). The system has a considerable number of adherents.

The Secular is defined as that which pertains to this life, and is treated as a thing apart; as independent of, rather than as necessarily opposed to, any other mode of thought and duty. S., as regards opponents, claims that to ignore is not to deny. As the geometrician ignores chemistry or metaphysics without a thought of denying them, so S., which concerns itself with this world, refuses to be held as conflicting with that 'other-worldliness' which, if demonstrable, must be based on an experience to which S. makes no pretension, and toward which it considers itself to incur no responsibility. S. begins with the proposition that intelligent sincerity is without conscious guilt, even when it is dangerously mistaken. S. takes Free Thought as its central idea; and defines it as the unrestricted application of the powers of the intellect to any subject—the absence of any threat or penalty, legal, spiritual, or social, for the exercise of thought. The Free Thought which S. inculcates, it protests, is not lawless thought, but the judicial action of the understanding. To the conception of Free Thought is necessary also the Free Publication of Opinion. Again, Free Thought that would command respect must be submitted to Free Criticism;

for thought is often foolish, often mischievous; and the right of criticism is the sole protection of the public from error. Free Thought must end in the Free Action of opinion, since he thinks to no purpose whose thought is inapplicable to conduct; and he withholds the sign of his own sincerity who does not unite his thought with action.

S. holds that Skepticism is the pathway to affirmative truth: so far from being a crime, skepticism is scrutiny: so far from being the end, it is the beginning, of inquiry—the first condition for recognition of unknown truth. He who would be master of his own mind must refuse to believe anything until he is compelled to believe it; it being no more safe to keep one's mind open to all notions than to keep one's door open to all comers. Since it is clear that Free Thought may be a nuisance or an outrage, unless Courtesy takes care of it, S. provides that advocacy shall be directed to exposure of error and elucidation of truth, without moral imputation on those whose opinions are controverted: the quality of the thought, and not the motive of it, is the proper and sufficient subject of discussion. S. further imposes on the action of Free Thought the limit that every one shall concede to others the liberty that he claims for himself, and shall permit to others, and shall recognize in each individual, 'liberty of action in all things by which others are neither injured nor damaged.'—In all the foregoing views S. presents no great difference from the familiar forms of cultured and courteous modern skepticism; nor indeed are these views, in many of their essential points, antagonized by a Christianity drawn not from human traditions, but from the Bible—except that a Christian philosopher might ask for information as to who or what is going to 'compel' any man to believe anything so long as the man refuses to believe that thing? Passing from these points, we come to the more distinctively secularist tenets.

S., regarding the one object of all Free Thought as the attainment of truth, finds in the study of nature its immediate sphere of exercise; for it holds that 'nature and human life are the immediate sources of truth and duty, which it most concerns man to master. Therefore respect for this life, respect for pure physical conditions, respect for the moral capacity of human nature, are conditions of secularist belief. S. is not committed to denying that there is other good—it does not meddle with that question; it says, whether there be other good or not, the good of the present life is good, and it is good to seek that good. It holds that the secular is sacred, and seeks "to find that material condition in which it shall be impossible for man to be depraved or poor." It does not say that all things are material, or that there are no spiritual agencies; it does not enter on these propositions, but confines itself to showing that there are material agencies in this life, whatever else there may be, and that these, as far as they can be discovered, are the calculable forces of the world, which cannot be neglected without folly or hurt, and that it is wisdom, mercy, and duty to attend to them.' Here, again, S. as a practical teaching is not new. Without entering on the question of the interference of Providence, S. contends that Science is practically the providence of life; that conscience is higher than consequence; that deliverance from calamity is more merciful than any system of consolation which only acts when calamity has occurred. S. proceeds in the path of Positive Philosophy. In sacred writ it seeks for thought which commends itself to reason and experience, accepting the intrinsically true, without entering on questions of inspiration or authenticity. 'Whatever principles S. inculcates, they are affirmative in their nature, relate to the welfare of humanity, and are determined by considerations purely human.'

There is unquestionably a vast outlying class in every Christian country who are without the pale of Christianity. They either dislike it, or they do not understand it. S. declares itself intended for these, and for all who find theology indefinite, or inadequate, or deem it unreliable; and it claims to address these classes in their common reason and intelligence, by an appeal to principles of a secular nature, common to humanity in every state and clime. S. is thus claimed to be an argument not against Christianity, but independent of it. It does not question the pretensions of Christianity; it advances others. 'S. does not say there is no light or guidance elsewhere, but maintains that there is light and guidance in secular truth, whose conditions and sanctions exist independently, act independently, and act forever. Secular knowledge is manifestly that kind of knowledge which is founded in this life, which relates to the conduct of this life, conduces to the welfare of this life, and is capable of being tested by the experience of this life.' It is the distinct assertion of S.: 'That which is secular can be tested in time; that which is theological is provable only after death.' This directly contradicts Christianity, which, appealing for its proofs to the history, experience, and observation of man in this world, thus declares that spiritual facts may *now* be tested and known by man.

The standard of S. is utilitarian. Utility is made the test of right, not (it is said) the utility which is sensual and selfish, but that which takes into account the highest attributes and noblest aspirations of humanity (see UTILITARIANISM). It is not the agent's own happiness, but the happiness of others which the utilitarian is bound to promote. In short, S. sets itself forth as the religion of this present life. It may be regarded as the practical part of Positivism—Positivism without its philosophy, its polemic, its ritual, or its attempt at poetic sentiment.

SECUND, a. *sĕk'ŭnd* [L. *secun'dus*, next in the same rank, second—from *sequi*, to follow]: in *bot.*, all turned to one side, as flowers or leaves on a stalk arranged on one side only. SEC'UNDINE, n. *-ŭn-dĭn*, in *bot.*, the second coat of the ovule, lying within the primine; the intine; the fetal membranes collectively.

SECUNDERABAD, *sē-kŭn-dėr-â-bâd′* (correctly Sikandarábád): large town, and important Brit. milit. cantonment in the Nizam's Dominions, India, six m. n. of Haidarábád. On the n.e. are two remarkable granite hills, large, hemispherical in shape, isolated, and having on their summits the tombs of Fakirs, which are visited by numerous pilgrims each year. The cantonment consists of a curved, irregular street, three m. in length, with the officers' houses on either side. There are numerous barracks, and good hospital accommodation. The milit. force stationed here 1883 was 5,632, of whom 2,276 were European. There are many tanks in the vicinity, and the water is good. The mean annual temperature is 81° 30′, and the climate is unhealthful—though less so now than formerly—during the rainy season. Pop. about 74,124.

SECUNDIANS, n. *sē-kŭn′dĭ-anz:* in *chh. hist.*, a Gnostic sect in the 2d c., founded by Secundus, one of the principal followers of Valentinus. He is believed to have maintained that there were two antagonistic first causes, light and darkness, or a prince of good and a prince of evil; views probably derived from Zoroastrianism.

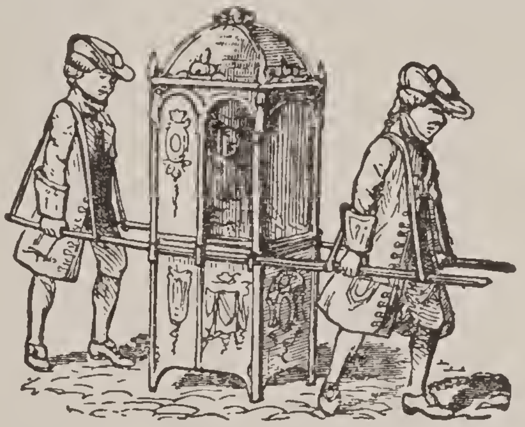
SECUNDUM ARTEM, phrase, *sē-kŭn′dŭm âr′tĕm:* according to art or rule; scientifically.

SECURE, v. *sĕ-kūr′* [L. *secūrus*, free from danger, secure—from *sĭnĕ*, without; *cura*, care: It. *sicuro*]: to protect; to render safe; to guard, as a prisoner; to put beyond hazard or doubt; to assure; to make certain; to fasten, as a door: Adj. free from danger, or the apprehension of it; protected; safe; confident; not vigilant; careless. Secu′ring, imp. Secured′ pp. *-kūrd′:* Adj. made certain; made safe. Secu′rer, n. *-kū′rėr*, one who secures. Secure′ly, ad. *-lĭ*. Secu′rity, n. *-rĭ-tĭ* [F. *sécurité*—from L. *securitātem*]: that which protects or secures; anything given or done as a pledge or guarantee; one who becomes surety for another; protection; confidence of safety; assurance. Secu′rities, n. plu. *-tĭz*, bonds, certificates of stocks, and the like, as evidence of debt or property (see Bond: Mortgage).—Syn. of 'secure, a.': safe; confident; careless; undisturbed, easy; certain; sure; assured; inattentive; heedless;—of 'security': defense; guard; shelter; protection; ease; assurance; surety; confidence; pledge; carelessness.

SEDALIA, *sē-dā′lĭ-a:* city, cap. of Pettis co., Mo.; on the Missouri Pacific and the Missouri Kansas and Texas railroads; 40 m. s. of Missouri river, 94 m. e. of Kansas City, 189 m. w. of St. Louis. It is on a high and picturesque prairie, in an agricultural and coal region; and owes its prosperity to the railroads that pass through it. It contains the locomotive shops of the Missouri Pacific railroad, and the general offices and car-shops of the Missouri Kansas and Texas railroad. There are manufactories of machinery, foundry products, agricultural implements, woolen goods, flour, soap, beer, and other commodities. The city is lighted by gas and electricity, has efficient water service; and includes among notable buildings, Sedalia Univ. (Presb.), new co. court-house (cost $115,000), 13 public schools, public high school ($40,000), 2 opera-houses, public library, several churches that cost $20,000—$30,000 each, 3 nat. banks (cap. $30,000), 2 state-banks (cap. $240,000), and 3 daily, 4 weekly, and 2 monthly periodicals. A U. S. govt. building (cost $50,000), Geo. R. Smith College, and the City Hospital. The city was founded 1860, was an important milit. post during the civil war, and was the centre of the great railroad strike 1886. Pop. (1880) 9,561; (1890) 14,068; (1900) 15,231.

SEDAN, *seh-dŏng′:* manufacturing town and frontier fortress of France, dept. of Ardennes. Pop. (1896) 20,163. In 1646 Colbert founded here the first of his famous cloth factories; and the fabrics of S. have now a European reputation, and employ many hands. There is also extensive industry in various branches of metallurgy; and there are coal and iron mines in the vicinity. The fortress of S., which had before been prominent in military history, was the scene of the most important battle, and one of the chief French disasters of the Franco-German war (q.v.). 1870, Sep. 2, Emperor Napoleon III., with his army, defeated in a terrific contest, and now shut in by an overpowering German force, capitulated—the emperor, 39 generals, 230 staff-officers, 2,600 officers, and 83,000 men, becoming prisoners of war.

SEDAN, n. *sē-dan′* [from *Sedan,* town in n. France, where first used]: covered portable chair for carrying a single person, borne on poles in the hands of two men. It is said that the Duke of Buckingham used one in the reign of James I., which gave general offense, indicated by the public remark that this royal favorite used his countrymen to do the work of beasts. The general introduction of sedans or sedan chairs into England dates from 1634, about the same period that hackney coaches came into use. Sedans were largely used during the greater part of the 18th c., being found well adapted for transporting persons, in full dress, to public and private entertainments. There were numerous public conveyances of this kind in London and all considerable towns; and the owner of every great mansion had his private sedan handsomely fitted up. In Edinburgh, in the 18th c., sedans were far more numerous than hackney coaches, and were almost all in the hands of Highlanders. Sedans are now seldom used except for transport of the sick.



Sedan-chair, Time of George II.

SEDATE, a. *sē-dāt′* [L. *sedātus*, composed, calm; *sedārĕ*, to settle—from *sedērĕ*, to sit: It. *sedato*]: staid; serious; calm; unimpassioned; composed; quiet. SEDATE′LY, ad. *-lĭ*. SEDATE′NESS, n. *-nĕs*, calmness of manner or countenance; composure; tranquillity. SEDATIVE, a. *sĕd′ă-tĭv* [F. *sédatif*]: composing; diminishing or allaying irritability or pain: N. a medicine which produces a soothing effect (see SEDATIVES).—SYN. of 'sedate': composed; tranquil; unruffled; serene; sober; serious; undisturbed; settled; calm; quiet; still; contemplative.

SED′ATIVES: medicines which exert a direct or primary depressing action on the vital powers, without inducing subsequent excitement. The diseases in which S. are employed are chiefly those of overexcitement of the nervous and circulating systems; and as some of the members of this class (hemlock, e.g.) act directly on the nervous system, while others (foxglove, e.g.) act more immediately on the heart, it is necessary to be able to determine the kind of sedative suitable for each individual case. Inflammatory fever presents all the conditions in which S. are likely to be of service. 'The excited heart, elevated temperature, hard and unyielding pulse, and the disordered state of the special nerves, call for the administration of remedies fitted to appease their excited energy. The following are among the important S.: aconite, carbonic acid (applied locally in cases of irritable bladder or womb, or to painful ulcers), chloroform (especially when inhaled), conium, digitalis, hydrocyanic acid, and tobacco. Some of these are highly dangerous except in cautious professional hands.

SEDENTARY, a. *sĕd′ĕn-tėr-ĭ* [F. *sédentaire*—from L. *sedentārĭus*, sedentary—from *sedens* or *seden′tem*, sitting; *sedērĕ*, to sit: It. *sedentario*]: accustomed to pass much time in a sitting posture; requiring much sitting or inactivity, as an employment or profession; inactive; sluggish: N. one of a tribe of spiders called the SED′ENTA′RIA, *-tā′rĭ-ă*. SED′ENTARILY, ad. *-ĭ-lĭ*. SED′ENTARINESS, n. *-ĭ-nĕs*, the state or quality of being sedentary. SEDENTARY OCCUPATION, employment which calls for no active physical exertion, usually pursued in a sitting posture.

SEDERUNT, n. *sĕ-dē′rŭnt*, in Scot. *sĕ-dā′rŭnt* [L. *sedērunt*, they sat; *sedērĕ*, to sit]: a sitting: in *Scot.*, the sitting of a court, or other regularly constituted body; the recorded list of the names of the members present at the sitting or meeting.

SEDGE, n. *sĕj* [AS. *secg*, sedge: Low Ger. *segge;* Ir. *seisg;* W. *hesg*, sedge]: water-iris or river-flag; a general name for the grass-like or rush-like plants of the ord. *Cyperācĕæ* (see CAREX). SEDGED, a. *sĕjd*, composed of flags or sedge. SEDGY, a. *sĕj′ĭ*, overgrown with sedge.

SEDG′WICK, CATHERINE MARIA. author: 1789, Dec. 28—1867, July 31; b. Stockbridge, Mass.; daughter of Judge Theodore Sedgwick, LL.D. At her father's death 1813, Miss S. established a school for young ladies, which she continued with great success for half a century. In 1822, she published *A New England Tale*, followed 1824 by *Ridwood*, a novel, so popular that it was reprinted in England, and translated into several European languages. This was followed by *Hope Leslie, or Early Times in America* (1827); *Clarence, a Tale of Our Own Times* (1830); *Le Bossu* and *The Linwoods* (1835), considered the best of her stories; and these by a series of popular stories, illustrating morals and domestic economy, entitled *The Poor Rich Man and the Rich Poor Man, Live and Let Live, Means and Ends, Home*, etc. Miss S. contributed 'Life of Lucretia Maria Davidson,' to Sparks's *American Biographies.* In 1841, on her return from Europe, she published *Letters from Abroad to Kindred at Home;* in 1845, *Wilton Harvey and Other Tales;* followed by *The Morals of Manners,* and *Married and Single.* She also edited, and was an active contributor to some of the leading periodicals. She died near Roxbury, Mass.

SEDG'WICK, John: soldier: 1813, Sep. 13—1864, May 9; b. Cornwall, Conn. He graduated from West Point 1837; served in the Seminole war and on the Canada border; was in the principal battles of the Mexican war, and was twice brevetted for gallant conduct. In the civil war he was at the siege of Yorktown; rendered valuable service at the battles of Fair Oaks, Savage Station, Glendale, and Antietam, and in the latter engagement received three wounds which disabled him for several months. He took the heights of Fredericksburg, had a brilliant part in the battle of Gettysburg after one of the hardest forced marches on record, and exhibited remarkable skill in capturing a division of Confederate troops, with their arms and flags, at the crossing of the Rapidan 1863, Nov. 7; was in the thickest fight in the battles of the Wilderness, and while arranging the positions of the artillery at Spottsylvania Court-House was instantly killed by a rifle ball fired by a sharpshooter. He was promoted col. U. S. army 1861, Apr.; brig.gen. vols. 1861, Aug.; maj.gen. vols. 1862, July 4; and was offered, but declined, the command of the Army of the Potomac. He was highly respected and, though a strict disciplinarian, was one of the most popular officers in the army. A fine statue, made of cannon captured by his troops, was placed at West Point 1868.

SEDG'WICK, Robert: soldier: about 1590–1656, May 24; b. England. He had been connected with a London artillery company, removed to Charlestown, Mass., 1635; engaged in mercantile affairs and accumulated considerable property, and was a member of the general court for several years. He was prominent in founding the Ancient and Honorable Artillery Company (Boston 1638), and two years later became its capt. He was commander of the castle 1641, col. of a regt. 1643, and commander of the state militia 1652; was engaged by Cromwell against the French at Penobscot 1654, and the Spanish W. I. 1655; and Cromwell promoted him maj.gen. and appointed him gov. of Jamaica shortly before his death. With John Winthrop, Jr., S. established 1643–4 the first iron-works in this country.

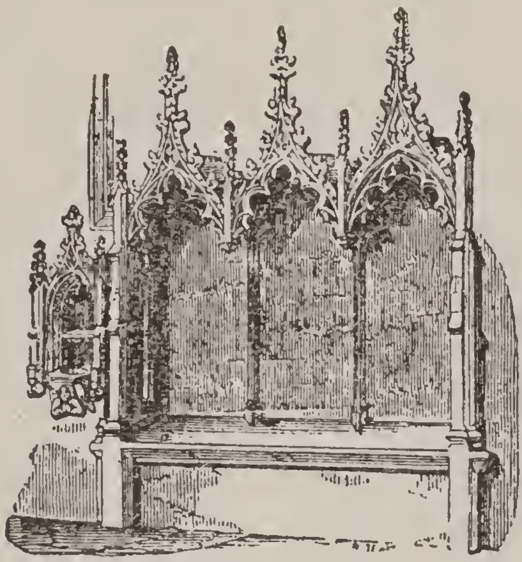
SEDG'WICK, Theodore, LL.D.: statesman and jurist: 1746, May—1813, Jan. 24; b. Hartford, Conn.; descendant of Maj.gen. Robert S. (q.v.). Educated at Yale College, he studied divinity, but turned to the legal profession 1766, and removed to w. Mass., where he was a member of the colonial assembly. He practiced law in Great Barrington, and afterward in Sheffield. Though a loyalist in feeling at the outbreak of the American revolution, he ardently took the part of his country, and served as aide-de-camp to Gen. Thomas in the unfortunate expedition to Canada 1776. In 1785, he settled at Stockbridge, Mass., where his descendants now reside; was a member of the continental congress 1785–6, and was active in suppressing Shays's rebellion. He remained in congress as representative 1789–96, and as senator 1796–99, acting as pres. of the senate 1797. He was again in the house of representatives 1799, and was chosen speaker. In 1802 he was appointed judge of the supreme court of Mass. S. was a prominent member of the old federalist party, and an early and open opponent of slavery. He died at Boston.—Henry Dwight S. (1785–1831), his 2d son, b. Sheffield, Mass.; graduated at Williams Coll. 1804, became an eminent member of the New York bar, and a legal writer of high repute.

SEDG'WICK, Theodore: lawyer and writer: 1780, Dec. 31—1839, Nov. 7; b. Sheffield, Mass.; son of Judge Theodore S., LL.D. (1746–1813). He was bred to the legal profession; and 1801 settled at Albany, New York, where he remained in successful practice until 1821, when he retired to Stockbridge, Mass., advocating, as a popular speaker, the interests of scientific agriculture, free trade, temperance, and anti-slavery. He wrote *Public and Private Economy, illustrated by Observations made in Europe in* 1836–7 (3 vols., 12mo, New York 1838). He died of a stroke of paralysis, after making a public speech in a democratic meeting at Pittsfield, Mass.—Susan Ridley S. (about 1789–1867), his wife, descended from an old English Border family, and proud of her relationship to Bp. Ridley, was a daughter of William Livingston, gov. of N. J. She was author of *The Morals of Pleasure* (1829); *The Young Emigrants*, and *The Children's Week* (1830); *Allan Prescott*, a novel (1834); *Alida* (1844); and *Walter Thornby*, a novel, written 1859, when she was more than 70 years old.

SEDG'WICK, Theodore: lawyer and writer: 1811, Jan. 27—1859, Dec. 9; b. Albany, N. Y.; son of the second Theodore S. (1780–1839). He was educated at Columbia College, and admitted to the bar 1833; and excepting three years spent at Paris, as sec. of the American legation, continued in successful legal practice until 1850, when he made an extensive tour in Europe. He steadily declined to engage in politics, and refused high offices tendered him, until, 1858, he accepted that of U. S. atty. for the s. dist. of N Y. Among his writings are, a standard *Treatise on the Measure of Damages;* a work on *The Interpretation and Application of Statutory and Con.*

stitutional Law; the *Memoirs of William Livingston,* his grandfather; *The Life and Works of William Leggett,* and various occasional addresses. He died at Stockbridge, Mass.

SEDILIA, n. plu. *sĕ-dī'lĭ-ă* [L. *sedīlĕ,* a seat, a chair—from *sedērĕ,* to sit]: seats; used in ecclesiastical language for certain seats in many churches set apart for the priests.



Sedilia, Bolton Percy, Yorkshire.

SEDIMENT, n. *sĕd'ĭ-mĕnt* [F. *sédiment*—from L. *sedimen'tum,* a settling down, a subsidence—from *sedērĕ,* to sit, to settle: It. *sedimento*]: the matter which subsides or settles at the bottom of a liquid; lees; dregs. SED'IMENT'ARY, a. *-mĕnt'ér-ĭ,* pertaining to sediment, or consisting of it. SEDIMENTARY ROCKS, rocks that have been formed by the depositions of materials that had been held in suspension by water.

SEDITION, n. *sĕ-dĭsh'ŭn* [F. *sédition*—from L. *seditĭō* or *seditĭōnem,* civil discord—from *se,* aside; *itĭō,* a going—from *īrĕ,* to go: It. *sedizione*]: tumultuous rising of men against law and order, of a local character, and less than an insurrection: in *law,* offenses against the state which fall short of treason—e.g., writing, publishing, or uttering words that might excite to treason or an insurrection. Sedition differs from treason in not being an act of direct and open violence against the laws, or of subversion of the constitution: it is punishable as a revolt against legitimate authority. SEDI'TIOUS, a. *-ŭs,* pertaining to sedition; tending to excite opposition to law or lawful authority; turbulent; factious. SEDI'TIOUSLY, ad. *-lĭ.* SEDI'TIOUSNESS, n. *-nĕs,* the quality of being seditious; the disposition to excite, or the act of exciting, popular disturbances in opposition to law.—SYN. of 'sedition': insurrection; revolt; tumult; mutiny; rebellion; uproar; riot; revolution.

SEDRAT, n. *sĕd'rāt* [Ar.]: in *Moham. myth.,* the lotus-tree standing on the right-hand side of the invisible throne of Ali, with two rivers running from its roots. Its boughs extend further than the distance between heaven and earth.

SEDUCE, v. *sè-dūs'* [L. *seducĕrĕ*, to lead aside, to separate—from *se*, aside; *ducĕrĕ*, to lead]: to entice from the path of rectitude, duty, or virtue, by flattery, bribes, promises, or otherwise; to lead astray; to corrupt; to deprave; to persuade to a surrender of chastity. SEDU'CING, imp.: ADJ. having a tendency to seduce; enticing; alluring. SEDU'CINGLY, ad. *-lĭ*. SEDUCED', pp. *-dūst'*. SEDU'CER, n. *-sèr*, one who leads astray; one who leads a female from the path of virtue. SEDUCE'MENT, n. *-dūs'mĕnt*, the means or arts employed to seduce. SEDUCTION, n. *sè-dŭk'shŭn* [F.—L.]: the act or crime of persuading a female to surrender her chastity; the means of leading astray. SEDUC'TIVE, a. *-tĭv*, tending to lead astray; enticing. SEDUC'TIVELY, ad. *-lĭ*.—SYN. of 'seduce': to entice; allure; inveigle; decoy; tempt; attract; mislead.

SEDUC'TION, in Law: act of a man who induces a woman to unlawful sexual intercourse with him. Formerly in some of the states, and still in England, S. is not a criminal offense, unless involving the crime of Abduction or of Rape, or unless the woman is of an age under the age of consent: but several of the states have now made S. a crime, by statute. Where such statutes do not exist, the woman has at common law no action for damages for S. unaccompanied by force or assault; though in many cases the same object is reached through suit for breach of promise of marriage. But the parent, or guardian, or any one to whom the woman can be showed to owe *service*, has right of action for loss of her services in case of such loss; and this right continues after a girl's majority if her duty of service remains. Though loss of services is the technical basis for the action, yet when that has been duly established, juries may, and usually do, give damages in some degree commensurate with the real injury wrought.

SEDULOUS, a. *sĕd'ū-lŭs* [L. *sedŭlus*, diligent, zealous—from *sedērĕ*, to sit]: diligent and persevering in any pursuit; laborious; industrious; unremitting. SED'ULOUSLY, ad. *-lĭ*. SED'ULOUSNESS, n. *-nĕs*, or SEDULITY, n. *sè-dū'lĭ-tĭ* [L. *sedulĭtas*]: the quality of being sedulous; steady diligence; diligent and assiduous application in any pursuit.—SYN. of 'sedulous': industrious; diligent; assiduous, laborious; unremitting.

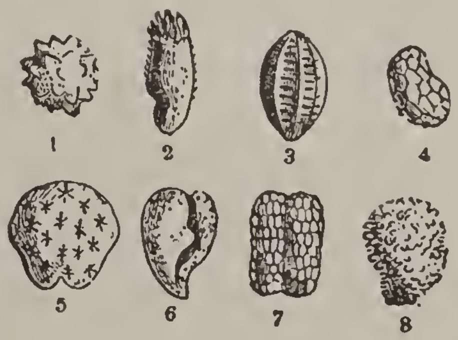
SEDUM, *sē'dŭm:* genus of plants of nat. order *Crassulaceæ*, having the calyx in 4—8 (usually 5) deep segments, which often resemble the leaves, the same number of spreading petals, twice as many stamens, and 4—8 (usually 5) germens, each with a nectariferous scale at the base. The species are numerous, with succulent, often roundish, leaves; and pretty, star-like flowers. Many grow on rocks, whence the English name STONE CROP. They are natives of temperate and cold parts of the n. hemisphere. They have no important uses; some are refrigerant, others are acrid. *S. Telephium*, popularly called ORPINE, is sometimes used as a diuretic; *S. acre* is a common species, whose brilliant yellow flowers adorn the tops of old walls, the débris around quarries, etc. Various species are much used in ornamental planting and window-gardens. Our native species include the Three-leaved S. (*S. ternatum*), the Wild Orpine (*S. telephioides*) of mountain rocks, and the Beautiful S. (*S. pulchellum*); none of them n. of Penn.

SEE, v. *sē* [AS. *seon;* Goth. *saihvan;* Dan. *see;* Ger. *sehen*, to see]: to perceive by the eye; to have the power of sight; to behold; to observe; to discover; to view; to understand; to know; to visit, as friends; to escort; to attend, followed by *to;* to experience. SEE'ING, imp. perceiving by the eye; understanding: N. sight; vision: CONJ. since; it being so; because that. SAW, pt. *saw*, did see. SEEN, pp. *sēn*, beheld; observed. SEE, int. *impera.* form of the verb *see;* lo! look! behold! SEER, n. *sē'r*, one who sees, used in composition, as a *sight-seer;* a person who can foresee future events; a prophet. SEERESS, n. fem. *sēr'ĕs*, a prophetess. SEE TO IT, look well to it; beware. LET ME SEE, or LET US SEE, phrases expressive of particular consideration of the subject under notice. TO SEE ABOUT A THING, to pay attention to it; to consider it.—SYN. of 'see': to behold; look; view; contemplate; regard; eye; perceive; scan; observe; descry; discern; distinguish; understand; comprehend; visit; feel; experience.

SEE, n. *sē* [OF. *sé, sed*, the seat or throne of a bishop—from L. *sēdēs*, a seat—from *sedērĕ*, to sit]; the seat of episcopal power; the jurisdiction of an archbishop or a bishop; a diocese; the authority of the pope or court of Rome; in *OE.*, a throne. See, in ecclesiastical use, properly signifies the seat or chair (*cathedra*), sometimes called 'throne,' of a bishop (see BISHOP). By universal usage, however, see designates the city (thence, at least in popular language, the entire diocese) in which the seat of the bishop is placed. Sees have, as a rule, been in some city, or considerable town; and in general the name of a see is taken not from the district governed by the bishop, but from the city or town. To this usage, the names of most of the Prot. Episc. sees in this country are an exception. Sees *In Partibus Infidelium* (q.v.) still retain their ancient names, though in many cases not merely the cities themselves, but even all traces of the Christian religion, in the sites on which they anciently stood, have disappeared. In the Roman Church, the pope alone establishes sees, and alters their distribution and their local limits and boundaries; though these changes are not made except in extreme cases (e.g., the French Revolution) without consent of the actual bishop. In the Anglican Church, this is done by authority of parliament. In the Prot. Episc. Church in this country, sees are created, and limits of diocese, changed, by authority of the gen. convention.

SEED, n. *sēd* [AS. *sæd;* Ger. *saat;* Dut. *zaad;* Dan. *sæd;* Icel. *sad*, seed]: that part of a plant which contains the rudiment or embryo of the future plant (see below): peculiar secretion in animals by which the ova are fertilized; that from which anything springs; semen: offspring; descendants; race; generation; birth; first principle: V. to grow to maturity and produce seed; to shed seed: to sow; to cover with seed-like ornaments. SEED′ING, imp. SEED′ED, pp.: ADJ. bearing seed; interspersed or covered with seed. SEED′Y, a. *-ĭ*, running to seed, or abounding in it; exhausted; poor; shabbily dressed; worn out—in allusion to the appearance of flowers deprived of their bloom. SEED′INESS, n. *-nĕs*, the state or quality of being wretched or miserable; in *slang*, suffering due to recent intoxication. SEED′NESS, n. in *OE.*, seed-time; time of sowing. SEED-BEARING, a bearing or producing seeds. SEED-BUD, the germ or rudiment of the fruit in embryo. SEED-CAKE, a sweet cake flavored with aromatic seeds. SEED-COAT, in *bot.*, the covering of a seed. SEED-CORN, grain or corn to be used for seed. SEED-DOWN, the down on vegetable seeds. SEED-LAC, lac in a granulated farm. SEED-LEAVES, the cotyledons or first leaves of an embryo plant. SEED′LING, n. *-lĭng*, a plant reared from a seed, and not from a layer or bud. SEED-PEARL, the smaller sort of pearls. SEED PLOT or -PLAT, a portion of ground on which seeds are sown to produce plants for transplanting. SEEDSMAN, n. *sēdz′măn*, a merchant who deals in the seeds of plants. SEED-TIME, the period of the year proper for sowing seed. SEED-VESSEL, in *bot.*, the organ which contains the seeds. SEEDS or GRAINS OF PARADISE, the seeds of the plant *Amŏmŭm Meleguĕttă*, or Meleguetta pepper, an aromatic carminative, ord. *Zin′giberācĕæ* or *Scitamin′ĕæ.*

SEED, in Phanerogamous Plants: that part which may in some measure be regarded as corresponding to the perfectly developed impregnated *ovum* of animals, and which is the utmost effort made by the plant for the reproduction of its species. It is the perfectly developed Ovule (q.v.). While one cell of the interior of the nucleus (see OVULE) greatly enlarges, the other cells are forced back; the interior of the nucleus thus becomes a cavity (the embryo



Various Forms of Seeds.

1. Eschscholtzia californica. 2. Corn Blue-bottle (*Centaurea Cyanus*). 3. Oxalis rosea. 4. Opium Poppy (*Papaver somniferum*). 5. Stellaria media. 6. Sweet-william (*Dianthus barbatus*). 7. Foxglove (*Digitalis purpurea*). 8. Saponaria calabrica.

sac), and Fecundation (q.v.) now taking place by means of the pollen, the primary cell is formed, which grows to form the *embryo*. As the fertilized ovule is developed into the ripe seed, the *foramen* (see OVULE) or *micropyle* closes completely; but its place is commonly marked in ripe seeds by a little cicatrix. In the ripe seed, the integuments of the ovule, more fully developed, form the covering (*spermoderm*); while the *nucleus* is either entirely converted into the Embryo (q.v.), or also into an unorganic cellular mass called the Albumen (q.v.), which is, in an economic view, the most important part of many seeds, as of those of the cereal grasses. The embryo, which in the reproduction of the plant, is the most essential part of the seed, is developed to various degrees in different plants—which is also the case in different animals, even in those of the same class, as in mammalia; but in general, the *radicle* may be distinguished in it—the beginning of the root or descending axis of the new plant, and the *plumule* or *gemmule*—the beginning of the stem or ascending axis, as well as the *cotyledon* or cotyledons, provided for nourishment of the new plant in its youngest stage. When the embryo is accompanied with albumen, it is sometimes completely inclosed in it; sometimes it lies at the side of the albumen and sometimes it surrounds the albumen like a ring, or even completely. Sometimes, but rarely, the embryo is not well developed in ripe seeds, so that its parts cannot be distinguished, as in the *Orchideæ*, in which it appears as a roundish or oval, uniform, little cellular mass. In germination, the embryo breaks through the covering of the seed, and develops itself into the new plant.

Seeds are either *sessile* or *stalked*. The stalk is of various length, and is formed of the *funiculus* or *umbilical cord;* the place at the base of the seed, by which it is affixed to the inside of the fruit, or to the end of the *funiculus*, being called the *Umbilicus* or *Hilum*. When the seed is perfectly ripe, it has no further need of connection with the parent plant, and the *funiculus* dries up, leaving the *hilum* a mere scar.

Besides being inclosed in a capsule, or in a succulent fruit, etc., the most essential parts of the seed have coverings of their own, reckoned as belonging to the seed itself. Its general covering is called the *spermoderm* (Gr. *sperma*, seed, *derma*, covering), which consists of an external membrane, the *testa* (Gr. shell) or *episperm* (Gr. *epi*, upon) and an internal membrane, the *endopleura* (Gr. *endon*, within, *pleura*, side). Sometimes there is within the episperm a fleshy layer, called the *sarcosperm* (Gr. *sarx*, flesh). The Aril (q.v.) is a comparatively rare additional covering.

The seeds of phanerogamous plants afford characters which distinguish two great classes as *Monocotyledonous* and *Dicotyledonous* (see COTYLEDON). Very few plants have more than two cotyledons (seed-lobes): however, some of the *Coniferæ* have more than two. Cryptogamous plants are designated also *Acotyledonous*, as having no seed-lobes; and the name *Spore* (q.v.) is given to their seeds distinctively.

The time during which vitality is retained varies greatly with seeds of different classes of plants, and with the conditions under which they are kept. When deeply buried in the soil they sometimes retain power of germination for a long period, and the appearance of fireweed after a forest has been cleared and the ground burned over, has been taken as an indication that only shallow covering was required to preserve seed for at least a century, though this change in the character of the vegetation may possibly be otherwise explained, There is no reason to suppose that the reputed growth of wheat taken from Egyptian mummies has any foundation in fact, and the stories regarding the growth of maize taken from the tombs of the Peruvian Incas are equally open to doubt. The loss of the natural moisture of seed caused by excessive drying; very low or very high temperatures; and exposure to air, especially if it is warm and damp, all tend strongly to destroy the vitality of seeds. If properly kept the seeds of most of our staple grains and vegetables retain germinating power 3 to 5 years; though seeds of a few kinds, e.g., onion and parsnip, cannot be depended on more than one year; while a few others, e.g., beet and squash, will grow when 6 to 10 years old. A small proportion of the seeds of many plants will germinate at a considerably greater age than indicated, but it is not large enough to make them profitable for the use of the farmer or gardener.

Seed-growing.—Until a comparatively recent period seed growing was not a separate industry in the United States. In all the early history of the country it was the custom for the farmer or gardener to grow year by year such seeds as he expected to need the following season. To some extent this method is still followed, though since 1850 the special business of seed-growing has assumed immense proportions. It is of utmost importance that the varieties of plants grown for profit be kept true to their names and absolutely pure. Hence the business of seed-growing requires thorough knowledge and careful attention to detail. The use of a single pound of lettuce seed which proved to be of a different variety from the one ordered has involved a market-gardener in a loss of over $1,000; and the damage annually sustained by the farmers and gardeners of this country through the use of impure or deteriorated seed amounts to millions of dollars. Seeds should always be grown from the finest specimens of plants or fruits: neglect of this will result in rapid deterioration of varieties and disappearance of their most valuable characteristics. Where early maturity is important, seed should be saved from the best of the specimens which ripen earliest in the season. In order to avoid 'mixing' it is necessary, with many classes of plants, to grow different varieties in different fields or in widely separated parts of the same inclosure. Certain soils are especially desirable for certain kinds of plants. Climate, also, exerts potent influence on the character of seeds, and goes far toward determining what varieties the grower in any specified locality can profitably produce. Thus the oat plant reaches full development only in a high latitude. A variety of this grain weighing 44 lbs. per bushel when grown in Scotland, if grown in our middle states three or four years will be reduced to 32 lbs. or less, per bushel, and will be still lighter in yield if grown farther south. It is useless to attempt to grow such seeds in a warm climate. On the other hand, plants which succeed best in warm countries deteriorate rapidly if grown from seeds raised near the n. limit of their cultivation. A few plants, like cauliflower, endive, radish, and spinach, either do not mature well in this country or else yield very little seed: consequently their seed is imported from Europe. Turnip seed is grown mainly at the north, okra at the south, and a large proportion of the seed of the early varieties of cabbage used in the United States is grown on the e. coast of Long Island. On account of its splendid climate and fertile soil, Cal. is likely to become a favorite locality for production of the seed of a large number of our staple plants and of many delicate flowers.

SEEK, v. *sēk* [Goth. *sokjan;* Icel. *sækia;* Dan. *söge;* Low Ger. *söken;* Ger. *suchen,* to seek]: to look, search, or inquire for; to endeavor to find or gain; to solicit; to resort or have recourse to; to go to find; to make pursuit. SEEK'ING, imp. SOUGHT, pp *sawt,* did seek. SEEK'ER, n. *-ėr,* one who seeks. TO SEEK AFTER, to attempt to find or take. TO SEEK FOR, to endeavor to find.

SEEL, v. *sēl* [OF. *siller,* to hoodwink—from L. *cilĭum,* an eyelid: It. *ciglio;* F. *cil,* an eyelid]: in *falconry,* to close the eye, as of a wild hawk in training; to hoodwink. SEEL'ING, imp. SEELED, pp. *sēld.*

SEELAND, *sē'land,* or ZEALAND (Dan. *Själland*): largest and most important island of Denmark; between the Cattegat and the Baltic; separated by the Sound from Sweden, and by the Great Belt from Fünen. Length 78 m.; extreme breadth 70 m.; 2,672 sq. m. The surface is almost flat; the coasts, rock-bound on the s.e., are indented by bays and fiords, the chief of which is the Roeskilde-Isefiord in the north. The rivers are small, the largest only 50 m. long; there are several lakes, and all the waters abound in fish. The island contains several beech-forests, is exceedingly fruitful in corn, and breeds excellent horses and cattle. Agriculture and cattle-breeding are principal employments. The chief place is Copenhagen (q.v.), capital of the country, on the e. coast; and from this city, railways traverse the island to Elsinore in the n., and to Korsör in the s.w., on the coast. Pop., including the 9 small islands, Möen, Samsoe, etc., about 722,000.

SEELEY, *sē'lĭ,* JOHN ROBERT: educator and author: b. London, 1834. He graduated from Christ's College, Cambridge, 1857; was elected a fellow of the college 1858, and lectured there a little more than two years, when he became assistant classical teacher at the City of London School. In 1863 he became prof. of Latin in University College, London; and 1869 prof. of modern history at Cambridge Univ., which position he held till death

He published *Ecce Homo* (1865), which appeared anonymously, attracted wide attention, and passed through several editions ; *Natural Religion* (1882) ; *Greater Greece and Greater Britain* (1887), etc. He d. 1895, Jan. 13.

SEELY, a. *sēl ĭ* [AS. *sælig*, happy] : in *OE.*, lucky ; happy ; foolish ; silly ; simple.

SEELYE, *sē'lĭ*, JULIUS HAWLEY, D.D., LL.D. : late pres. of Amherst Coll. : b. Bethel, Conn., 1824, Sep. 14 ; graduated at Amherst 1849, and Auburn Theol. Seminary 1852. After a year of study in Germany, he was pastor of the Ref. Dutch Chh., Schenectady, N. Y., 1853–58, prof. of mental and moral philos. at Amherst 1858–75, and pres. of the college 1877–90, resigning on account of ill health, but continuing as lecturer. He served in the U. S. congress 1875–77, not seeking the election, whose campaign cost him only one postage-stamp, and declining renomination. His position on public questions was that of an independent republican. In 1872 he voyaged around the world, in company with Dr. Edward Hitchcock and Abijah Fitch, delivering in India lectures defending Christianity, attended largely by educated Hindus, and afterward published in their language as well as in Japanese and German, the second English ed. with the title, *The Way, the Truth, the Life.* He served on the Mass. commission for revising the tax system, the report of which is an important volume ; and was long a trustee of several state and educational institutions. As one of the board of visitors dealing with the question of the Andover theology, his stand was nonpartizan, yet conservative. While pres. of the college, he introduced a system by which a senate of students participates in discipline. He published numerous baccalaureate and other sermons, and articles in magazines and reviews : translated Schwegler's *History of Philosophy* (1856) ; published *Christian Missions* (1875) ; and *Duty* (1891). He also revised Hickok's *Moral Science* and Hickok's *Empirical Psychology.* He d. 1895, May 12.

SEE'LYE, LAURENS CLARK, D.D. : educator : born Bethel, Conn., 1837, Sep. 20. He graduated from Union College 1857 ; studied theology at Andover Seminary 1857–59, and at the Universities of Berlin and Heidelberg 1860–62 ; and then travelled in Europe and the East. In 1863 he became pastor of the North Congl. Church, Springfield, Mass. ; was prof. at Amherst College 1865–73 ; was prominent in the organization, at Northampton, of Smith College for women, and 1874 was appointed pres. of that institution, which office he still holds (1891). He has written on educational and literary topics for various reviews.

SEEM, v. *sēm* [a secondary application of the OE. *seem*, to become, a sense still apparent in *seemly:* Bav. *zemen;* Ger. *ziemen*, to become, to beseem: Icel. *sæma*, to conform to; *sæmr*, becoming, fit; *stoma*, to beseem]: to appear; to have a semblance; to have the appearance of truth or fact; to pretend; to be specious; to look like. SEEM'ER, n. *-ér*, in *OE.*, one who or that which carries an appearance. SEEM'ING, imp.: ADJ. in appearance; specious; in *OE.*, fair appearance: N. show; semblance; fair appearances. SEEM'INGLY, ad. *-lĭ*. SEEM'INGNESS, n. *-nĕs*, fair appearance; semblance. SEEM'LY, a. *-lĭ*, becoming; fit; proper; decent; comely: AD. in a decent or proper manner. SEEM'LINESS, n. *-lĭ-nĕs*, the state or quality of being seemly. IT SEEMS, denoting an appearance, but not a reality; used ironically to condemn the thing mentioned; used also as affirmation of fact; it appears to be; as is said.—SYN. of 'seemly': suitable; appropriate; meet; congruous; decent; decorous.

SEEM, v. *sēm:* OE. for BESEEM.

SEEN: pp. of SEE, which see.

SEEP, n. *sēp* [AS. *sipian*, soak]: to soak through pores or interstices; to percolate. SEEP'AGE, n. the act of oozing or percolating, the fluid or moisture that percolates, or the quantity of fluid that so passes.

SEER: see under SEE 1: see also PROPHECY.

SEER, n. *sēr* [*sér* in various Hindu languages]: a weight in Anglo-India equal (since 1871) to a kilogram.

SEESAW, n. *sē'saw* [an imitative word, expressive of the sounds of the upward and downward motions of a *saw*]: a motion backward and forward, or upward and downward; a reciprocating motion; a play of children, in which two are seated, one on each end of a board balanced on a log of wood, or similar elevation, the board being then made to move alternately up and down; in *whist*, the playing of two partners by which each wins the trick in succession: ADJ. pertaining to a motion up and down, or to and fro: V. to swing or move backward and forward, or to move upward and downward; to move with a vibratory or reciprocating motion. SEE'SAWING, imp. SEE'SAWED, pp. *-sawd.*

SEETHE, v. *sēth* [Icel. *sjoda*, to cook by boiling: Ger. *sieden;* Dan. *syde;* Low Ger. *suddern*, to boil: Scot. *sotter*, to simmer]: to boil; to prepare for food in a hot liquor; to be hot, or very hot; to steep; to soak. SEETH'ING, imp.: ADJ. boiling: N. state of boiling. SEETHED, or SOD, pt. SEETHED, pp. *sēthd*, or SODDEN, pp. *sŏd'dn.*

SEFATIANS, n. *sē-fā'shĭ-anz* [Ar. *sefat*, qualification, attribute]: a sect of Mohammedans who held that God possessed eternal attributes, and that there was no difference between the 'essential attributes' and the 'attributes of operation.' To these they in process of time added a third category, 'declarative attributes,' by which they understood anthropomorphic expressions—e.g., God's eye, his arm, his hand, etc. They were opposed to the Motazilites (q.v.). They ultimately split into several sects, some of which still exist.

SEG, or **Segg**, n. *sĕg* [Icel. *saga*, to cut off or out]: in *Scot.* and *prov. Eng.*, a castrated bull; a bull castrated at his full age.

SE-GAN FOO, *sē-gân' fô:* cap. of the province Shen-see in n.w. China; lat. 34° 17′ n., long. 108° 58′ e. It is next to Pekin in size and importance, nearly 10 m. sq. Its walls successfully resisted siege in the Mohammedan rebellion 1868–70. On the great road from China to central Asia, and the focus of other thoroughfares, it is a centre of commerce and manufacture. The city was founded B.C. 246 by the first universal emperor, Che Hwang-te, and named Kwan-chung; under various names, it was cap. of several dynasties. Its most interesting monument is the Nestorian tablet, a stone slab 7½ ft. high and 3 ft. wide, in the wall of an old temple, discovered 1625; it gives an abstract of vague doctrine, an account of the arrival of the Christian missionary Olopun 635, imperial approval of translated sacred books, reverses under Buddhist ascendency, restoration to favor under Yuen-tsung 713–755—the Chinese inscriptions ending with date of erection 781, and followed by Syriac and Estrangelo characters, giving name of the Nestorian patriarch, of Adam, Bp. of China, etc. The Chinese 'forest of tablets' records 5 dynasties, historical legends, 13 classics, and has a likeness of Confucius.—Pop. about 1,000,000; of whom about 50,000 are Mohammedans.

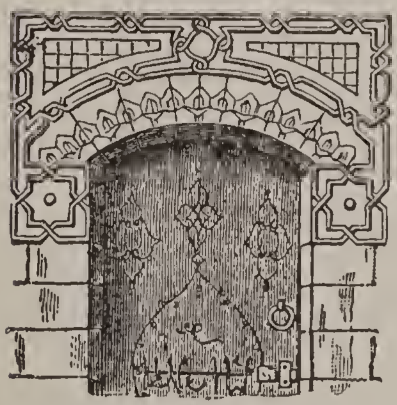
SEGAR: see Cigar.

SEGGAR, or Saggar: see Sagger.

SEGGING, n. *sĕg'ĭng* [Scot. (see Sag)]: a disease in oats which stints the leaves and hardens the roots; in *Scot.*, the act of falling down, or state of being sunk.

SEGHOL, n. *sĕg'ŏl:* a Hebrew vowel-point equal to *ĕ* in English. Segholate, a. *sĕg'ō-lāt*, marked with a seghol.

SEGMENT, n. *sĕg'mĕnt* [F. *segment*—from L. *segmen'tum*, a piece cut off—from *seco*, I cut: It. *segmento*]: a part cut off or divided; one of the sections that many animals, such as worms, are divided into: in *geom.*, part cut off from any figure by a line or a plane; portion cut off from a circle by a line, or from a sphere by a plane: when the angle subtended at the centre of a circle by the segment, and the radius, or when the chord of the segment and its height, are known, the length of the arc of the segment and its area can be determined with as much accuracy as the circumference and area of the whole circle (see Sphere). *Segment* in *bot.* is the division of a frond. Segment, v. *sĕg-mĕnt'*, to divide or become divided into segments. Segment'ing, imp.: N. the act of splitting into segments or divisions. Segment'ed, pp.: Adj. divided into segments.



Segmental Arch (from a private house, Cairo).

SEGMENT OF A CIRCLE, in *geom.*, the part of a circle cut off by a chord. SEGMENT OF A SPHERE, the part of a sphere cut off by a plane. SEGMENTAL, a. *sĕg-mĕnt'ăl*, relating to or resembling a segment. SEGMENTAL ORGANS, in *zool* the excretory organs of segmented animals. SEGMENTATION, n. *sĕg'mĕn-tā'shŭn*, a dividing into segments.

SEGNO, n. *sĕn'yō* [It. *segno*—from L. *signum*, a mark] in *music*, word, or sign, used in connection with marks of repetition. AL SEGNO, to the sign—a direction to return to the sign. DAL SEGNO, from the sign—the sign :S: being placed over the point where the repetition is to commence.

SEGO, *sā'gō:* important town of w. Africa, cap. of the state of Bambarra; on the Niger, here called the Joliba, lat. 13° 5′ n., long. 7° w. Its streets, which are winding, have a breadth of 24 to 26 ft., and are extremely clean. The palace of the king is large enough to accommodate 2,000 men and 500 horses. The houses are of clay and are flat-roofed, and the royal residence differs from the other dwellings only in size. The country in the vicinity is well cultivated, and the town is the seat of considerable traffic. Mungo Park, from whom we derive almost all the knowledge we possess of S., here first beheld the Joliba. Pop. estimated 30,000.

SEGORBE, *sā-gōr'bā:* small town of Spain, in the modern province of Castellon, on the right bank of the Palancia, in a valley renowned for beauty of scenery and amazing fertility; 20 m. n.w. of Murviedro. It stands on a hill between two castles, and contains stately houses, numerous churches, and a cathedral. Brandy-distilling is largely carried on, and there are flour and paper mills. Pop. 8,200.

SEGOVIA, *sā-gō'vē-â:* interesting city of Spain, cap. of the modern province of S. (see CASTILE); on the Eresma, by which it is nearly encircled; 47 m. n.n.w. of Madrid. It occupies the top of a rocky knoll, 3,300 ft. above sea-level; is surrounded by picturesque walls with round towers; and consists of narrow uneven streets, with old, quaint, and stately houses, 24 parish churches, and 21 convents. The Alcazar, or castle, is perched on the w. extremity of the rocky height, and was originally Moorish, but repaired magnificently 1452–58. The cathedral of S., a noble specimen of florid Gothic, is one of the finest in Spain. The present building was begun 1525. The square cupola-crowned tower is 330 ft. high, and the prospect from it is superb. The grand aqueduct of S., supposed to have been built in the time of Trajan, is believed to be the most important Roman structure in Spain: it consists of two rows of arches, one resting upon the other, 2,500 to 3,000 ft. long, and 102 ft. high. There is a mint for coining copper money. There is some wool-scouring and manufacture of woolen fabrics. Pop. (1887) 14,399.

S. was a place of importance during the time of the Romans; was the seat of immense cloth-manufactures in the time of the Moors; and was frequently the residence of the kings of Castile and Leon. Charles I. of England lodged at the Alcazar 1623. The unresisting town was sacked 1808 by the French, under Frere.

The *province* of S. has 2,714 m.; pop. (1887) 154,457.

SEGREGATE, v. *sĕg′rĕ-gāt* [L. *segrĕgātus*, set apart, separated—from *se*, aside; *gregārĕ*, to collect into a flock—from *grex* or *grĕgem*, a flock: It. *segregare*]: to separate from others; to set apart: Adj. in *bot.*, separated from each other. Seg′regating, imp. Seg′regated, pp. Seg′rega′tion, n. *-gā′shŭn* [F.—L.]: separation from others; a parting.

SEGUIDILLA, n. *sĕg-ĭ-dēl′ya* [Sp.]: in *mus.*, a lively Spanish dance, similar to the country-dance. The tune is in $\frac{3}{4}$ or $\frac{3}{8}$ time.

SEGUIN, *sĕh-gwĭn′*, F. *sĕh-găng′*, Edouard, m.d.: 1812, Jan. 20—1880, Oct. 28; b. Clamecy, France. After a full collegiate education he was instructed in medicine and surgery by Jean Gaspard Itard, on whose recommendation he entered on a life-long investigation of idiocy, as to its causes and the mitigation of its evils. His great work began with the treatment of an idiot boy 1837. Two years later he founded the first school ever opened for idiots. The results of his system soon attracted wide attention. A committee appointed 1844 by the Paris Acad. of Sciences carefully examined his methods and reported that the hitherto insuperable difficulties in imparting instruction to idiots had been removed. Two or three schools in which his plans were followed were opened in the United States. At the close of the revolution of 1848, S. came to this country, visited the schools which had been opened, and aided in establishing others. In 1851 he settled at Portsmouth, O., where, for a while, he practiced medicine; was afterward connected with various schools, some of which he helped to organize; and after a visit to France settled 1859 at Mount Vernon, N. Y., where he practiced medicine till 1863, when he removed to New York. He invented the physiological thermometer and other instruments; was govt. commissioner to the Vienna Exposition 1873; and founded 1879, at New York, the Seguin Physiological School for Feeble-minded Children. Among other works, he published *Traitement moral, Hygiène et Education des Idiots et des autres Enfants arrières* (1846), which is still the standard work on the subject; *New Facts and Remarks concerning Idiocy* (1869); and *Medical Thermometry and Human Temperature* (1876). He died at New York.

SÉGUR, *sā-gür′*: French family, distinguished in arms and letters; of Limousin origin, and known there, it is said, as far back as the 9th c. The first notable member was Henri François, Comte de S. (1689–1751), French gen. in the war of the Austrian succession.—His son, Philippe Henri, Marquis de S. (1724–1801), fought in the Seven Years' War, obtained the dignity *Maréchal de France* 1783, and outlived in his retirement the stormy scenes of the Revolution.—The eldest son of this Philippe Henri was Louis Philippe, Comte de S. (1753–1830), a vivid, dashing sort of man, for some years ambassador at the court of St. Petersburg, and a great favorite with Catherine II. Of impressionable fancy, full of enthusiasm for the 'philosophers,' the 'reign of reason,' and the 'new ideas' generally, he hailed the great Revolution with delight, but took no prominent part in it. His public career during the empire was respectable, but not brilliant: the last act of his life was a eulogium on the revolution of July. As a writer, S. has in wonderful perfection the national graces of style and spirit. Among his numerous writings are: *Pensées Politiques* (Par. 1795); *Histoire de Frédéric Guillaume II.* (Par. 1800); *Contes, Fables, Chansons et Vers* (Par. 1801); and *Mémoires ou Souvenirs et Anecdotes* (Par. 1824).—He left two sons, Octave and Paul Philippe: the latter (1780–1873) was a gen. of the first empire, took part in the fatal expedition to Russia 1812, and wrote the story of the campaign, *Histoire de Napoléon et de la Grande Armée pendant l'Année* 1812 (Par. 2 vols. 1824). The work has had immense success, and has been translated into almost all languages of Europe. Other works of the Comte Paul Philippe de S. are: *Lettre sur la Campagne du Général Macdonald dans les Grisons* (Par. 1802); *Histoire de Russie et de Pierre le Grand* (1829); *Histoire de Charles VIII.* (1834); *Histoire et Mémoires* (1873).

SEGURA, *sā-gō'râ:* river in s.e. Spain, rising in the Sierra Seca, and, after an e.s.e. course of about 180 m., entering the Mediterranean 27 m. below Orihuela. Ships unload at its mouth.

SEICENTISTI, *sĕ-ĭ-chĕn-tĭs'tĭ:* collective name for Italian authors of the 17th c.—a period of literary decadence, whence the name has come to indicate the low or tasteless in literature.

SEID, n. *sē'ĭd* or *sād:* see Said 2.

SEIDLITZ, a. *sĕd'lĭtz:* denoting a saline water from *Seidlitz,* in Bohemia. Seidlitz powders, imitating the waters, are composed of 120 grains of tartrate of soda and potash, and 40 grains of bicarbonate of soda reduced to powder, mixed and inclosed in a blue paper, and 35 grains of powdered tartaric acid in a white paper. The contents of the blue paper are dissolved in from half a tumbler to a tumbler of water, and those of the white paper are then stirred in. The mixture should be taken immediately during the effervescence from liberation of the carbonic acid. These powders act as an agreeable and mild cooling aperient. A stronger dose is made by adding sulphate of magnesia (about a dram).

SEIGNEURY, n. *sēn'ū-rĭ,* plu. Seign'euries, *-rĭz* [F. *seigneurie*]: same as Seigniory: see Seignior.

SEIGNIOR, n. *sēn'yŏr* [F. *seigneur;* It. *signore;* Port. *senhor;* Sp. *señor,* lord, sir, gentleman—from L. *senĭor,* elder; *senex,* old]: a title of honor, or simply a word of address, in s. Europe—represented in Britain and the United States by *Sir* or *Mr.*, in France by *Monsieur,* and in Germany by *Herr.* Seigniorial, a. *sēn-yōr'ĭ-ăl,* or Seigneurial, a. *sēn ūr'ĭ-ăl,* pertaining to the lord of a manor; vested with large powers; independent; manorial. Seigniorage, or Seignorage, n. *sēn'yŏr āj,* a charge levied on bullion brought by private individuals to the mint to be coined, which is effected by giving back rather less in coin than was received in bullion, only sufficient in amount to cover the expense—in England the coinage of bullion is generally done at the public expense, but there is a large seigniorage levied on silver and copper currencies; *formerly*, a specific tax on bullion as well as on silver and copper coinage, forming a branch of the royal revenue; acknowledgment of power; a royalty, especially that derived by an author from the copyright of his works. SEIGN'IORY, or SEIGN'ORY, n. *-ĭ*, a lordship; manorial power or authority; in *Lower Canada*, the right of feudal superiority. GRAND SEIGNIOR, the Sultan (q.v.) of Turkey.

SEINE, *sān:* the metropolitan dept. of France, completely inclosed by the dept. of Seine-et-Oise. It is a portion of the former province of L'Ile-de-France, and derives its name from its principal river (see SEINE, river). It is the smallest and the most populous dept. in the republic; 185 sq. m. From s.e. to n.w., the dept. is traversed 37 m. by the winding Seine, which receives the navigable Marne at Charenton, and the Bièvre at Paris. The surface is marked by undulations and low hills, the highest, Mont Valérien, only 446 ft. above sea-level. The climate is pleasant and healthful. The scenery—of which the woods of Verrières, Meudon, and Saint-Cloud, together with those of Vincennes and Boulogne, transformed into parks, and watered by artificial rivers and lakes, are perhaps the most striking features—is remarkably pleasing. A network of canals and railways, the latter converging in the capital, affords easy transit in any direction. The soil is calcareous, and in the greater part naturally infertile; but, by the skill of the farmers and gardeners, who obtain abundant manure from the metropolis, the country around Paris (q.v.) and its suburbs has been rendered remarkably productive. The culture of vegetables and fruits for the Paris markets is one of the most important branches of husbandry. Enormous quantities of mushrooms are cultivated in the ancient quarries of Paris near Montrouge. Quarries abound, and are productive.—Pop. (1876) 2,410,849; (1886) 1,961,089; (1891) 3,141,595; (1901) 3,669,930.

SEINE (anc. *Sequana*): one of the most important rivers of France, rising near Mont Tasselot, in the middle of the dept. of Côte-d'Or, and, after leaving the n. boundary of that dept., flowing w.n.w. through the depts. of Aube, Seine-et-Marne, Seine, Seine-et-Oise, Eure, and Seine-Inférieure, to the English Channel, which it reaches at Havre, after a course of 482 m. A straight line from source to mouth measures 250 m. It passes the towns of Troyes, Méry—where, 350 m. from its mouth, it becomes navigable for small boats—Corbeil, Paris, Elbeuf, Rouen, and Havre. The source is about 1,545 ft. above sea-level; but below Paris its current is slow, and its course to Rouen has numerous windings. It is connected by many canals with adjacent river-basins. At Paris, navigation begins for boats drawing 9 or 10 ft.; at Poses the tide is met; at Rouen begins sea-navigation. The principal affluents are, from the right, the Aube, Marne, and Oise; from the left, the Yonne, Loing, Essone, and Eure.

SEINE, or **Sein**, n. *sēn* [F. *seine*—from L. *sagēna;* Gr *sagēnē*, a large net]: a large fishing-net: also **Sean**
Seining, n. *sēn'ĭng*, the act of fishing with a large net.

SEINE-ET-MARNE, *sān-ā-mârn':* inland dept. in n. France, bounded e. by the dept. of Seine-et-Oise, and forming a portion of that wide basin in the middle of which stands Paris: area 2,275 sq. m. The dept. is named from its two chief streams, of which the Seine flows through the s., and the Marne through the n. part. There are no mountains, but ridges of low hills separate the fertile and extensive though not deep valleys. Timber is grown in every part: among the forests is that of Fontainebleau. The soil is generally fertile. Of cereals, wheat is the principal crop. Vegetables and fruits are largely grown, and the meadows and pastures, natural and artificial, are extensive and productive. The wines are mediocre, but the grapes for the table, called the *Chasselas de Fontainebleau*, have a European reputation. The river Marne marks the n. limit of the vine. The cap is Melun; and the arrondissements are Melun, Coulommiers, Fontainebleau, Meaux, and Provins. Pop. (1886) 355,136; (1901) 358,325.

SEINE-ET-OISE, *sān-ā-wāz':* dept. in n. France, inclosing the metropolitan dept. of Seine (q.v.); 2,184 sq. m. The great rivers are the Seine and Oise, with numerous affluents. Extensive plains occupy the s. districts; but in the n., the country has picturesque valleys and great forests. The soil is not in general very fertile; but owing to the vicinity of the capital the amount of produce is great. Among minerals, are several fine varieties of stone and fine clays. In addition to the usual manufactures, which are numerous and extensive, porcelain is largely made at the famous Sèvres (q.v.) factories. The dept. is divided into the arrondissements of Versailles, Corbeil, Étampes, Mantes, Pontoise, and Rambouillet; and the cap. is Versailles.—Pop. dept. (1886) 618,089; (1901) 707,325.

SEINE-INFÉRIEURE, *sān-ăng-fā-rē-ėr':* maritime dept. of France, bounded n.w. by the English Channel, s. by the dept. of Eure; 2,328 sq. m. The Seine flows through the s. districts; but a number of important though small streams flow n.w. across the dept. and fall into the Channel. The range of the hills of Caux extends e. to w.; and s. of it are rich pasture-lands, watered by the Seine and its affluents. Manufactures are very largely developed, and in many branches. Husbandry flourishes chiefly in the middle and e. districts. The coasts are of chalk-cliffs, in height 200 to 650 ft. The arrondissements are Dieppe, le Havre, Rouen, Neufchâtel, and Yvetot. The cap., Rouen, communicates with Dieppe by a direct line of railway.—Pop. dept. (1876) 798,414; (1886) 833,386; (1901) 583,883.

SEIRFISH, *sēr'fĭsh* (*Cybium guttatum*): fish of family *Scombridæ*, having finlets, and the sides of the tail keeled, the teeth compressed and sharp. It inhabits the seas of the E. Indies, and is one of their most valuable fishes. In size and form, it is very similar to the salmon, which its flesh resembles in firmness and flavor, though of white color.

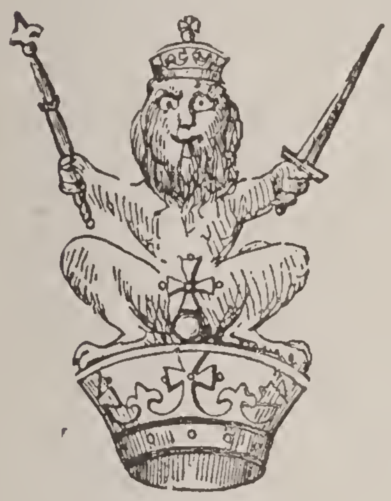
SEISMIC, a. *sīz′mĭk*, or Seis′mal, a. *-mal* [Gr. *seismos*, an earthquake—from *seiō*, I shake]: pertaining to an earthquake.

SEISMOGRAPHY, n. *sīz-mŏg′rā-fĭ* [Gr. *seismos*, an earthquake—from *seiō*, I shake; *graphō*, I describe]: a writing about, or a description of, earthquakes. Seismograph, n. *sīz′mō-grăf*, an apparatus for registering the shocks and undulatory motions of an earthquake. Seis′mograph′ic, a. *-grăf′ĭk*, a term applied to maps or charts constructed to indicate the centres of convulsions, lines of direction, areas of disturbance, and the like. Seismology, n. *sīz-mŏl′ō-jĭ* [Gr. *logos*, discourse]: the science of earthquakes. Seismom′eter, n. *-mŏm′ĕ-tėr* [Gr. *metron*, a measure]: an instrument for measuring the duration and force of an earthquake, or of any movement of the ground. Seismom′etry, n. *-ĕ-trĭ*, the mensuration of certain phenomena of earthquakes. Seismoscope, n. *sīz′mō skōp* [Gr. *skopĕō*, I see or spy]: an instrument for rendering visible the very feeblest impulses of an earthquake.

SEISTAN, *sās-tân′* (or Sistan), Lake of; or Hamoon Lake, *hâ-môn′* (anc. *Aria Palus*): large, irregularly shaped, shallow lake or lake-basin in the long-disputed border region between Persia and Afghanistan; bordered with plantations of tamarisk and low trees, and inclosed by the province of Seistan. It is 25 parasangs (a parasang = 3·45 English m.) in length, and 6 to 12 parasangs in breadth. It is difficult to fix accurately the form and position of the lake, but the most recent explorations seem to confirm Gen. Ferrier, who says that it is in lat. about 31°—32° n., and that it lies obliquely from 60° long. in the n. to 59° long. in the s. It was visited 1872 by Major Lovett and Sir Richard Pollock. Of the rivers which feed the lake, none, except the Helmund, contribute any waters during the summer, as they are then diverted for irrigation of the land. The lake, which has no outlet, in time of flood overflows its boundaries, and fertilizes large tracts of country. It is only about 4 ft. deep through large portions; and in dry seasons it becomes a mere swamp. It is the remainder from an ancient lake which must have been of great size. Its waters are black and disagreeable to the taste.—Seistan is a corruption of Saghistan—i.e., the country of the saghis, a kind of wood which grows here in abundance.

SEIZE, v. *sēz* [F. *saisir*, to seize—from mid. L. *sacīrĕ*, to take possession: OHG. *sazzan*, *sezzan*, to put in possession of]: to take or lay hold on suddenly; to take possession of without right; to take forcible possession of by legal authority; to put or be in possession; to arrest or capture; to fasten *on* or *upon*. Seiz′ing, imp. Seized, pp. *sēzd*. Seiz′er, n. *-ėr*, one who seizes. Seiz′or, n. *-ŏr*, in *law*. one who seizes or takes possession. Seiz′able, a. *-ă-bl*, that may be seized; liable to be seized. Seizure, n. *sēzh′ūr*, the act of seizing; the state of being seized; the act of taking forcible possession; the thing taken or seized; capture; act of taking by warrant; grasp; possession. To

BE SEIZED OF, to have possession. SEIZIN, or SEISIN, n. *sēz'ĭn* [F. *saisine*, possession of land]: in *law*, possession, or the act of taking possession, as of land (*Sasine* is the obs. Scotch form). SEIZIN IN FACT or DEED, when there is actual possession. SEIZIN IN LAW, when something is done short of actual possession, but which the law considers possession.—SYN. of 'seize': to grasp; capture; clutch; snatch; catch; apprehend; arrest; take; gripe; fasten; fix.



Sejant affronté.

SEJANT, a., or SEJEANT, a. *sē'jănt;* in F. ASSIS [Norm. F. *sejant*, sitting: F. *séant*, sitting; *seoir*, to sit—from L. *sedērĕ*, to sit]: in *her.*, sitting, like a cat, with the forefeet straight. SEJANT RAMPANT, sitting with the forefeet lifted up.

SEJANUS, *sē-jā'nŭs*, ÆLIUS, *ē'lĭ-ŭs:* minister of Tiberius (q.v.).

SELACHII, n. *sĕ-lā'shĭ-ī* [Gr. *sel'ăchos*, a fish having cartilages instead of bones]: the cartilaginous order of fishes, as the sharks, rays, etc. (see CARTILAGINOUS FISHES: PLAGIOSTOMI). SELA'CHIAN, n. *-ăn*, one of the Selachii.

SELAH, n. *sē'lă* [probably from Heb. *sáláh*, to rest]: a Heb. word used in the Psalms and in the prophet Habakkuk, and supposed by some to denote that there is to be a pause in the singing of the song—by others, an increase in the sound.

SELBY, *sĕl'bĭ:* market-town and river-port in the W. Riding of Yorkshire, England; on the right bank of the Ouse, 12 m. s. of York by railway. The ancient Gothic cross which adorns the market-place, and the character of the architecture of the houses, attest the age of the town. The magnificent parish church, 300 ft. long by 60 ft. wide, is part of an abbey founded by the Conqueror 1068. The movable bridge across the river offers passage to shipping, and the river is navigable to S. for vessels of 200 tons. Means of communication by railway and canal are abundant. There are iron and brass foundries, and slips for building river-craft; and the manufactures include sail-cloth, ropes, etc. Pop. (1881) 6,033; (1891) 6,022.

SELCOUTH, a. *sĕl'kôth* [AS. *seld-cuth*, seldom known—from *seld*, seldom; *cuth*, known]: In *OE.*, uncommon; rarely known.

SELDEN, *sĕl'dĕn*, John: illustrious English scholar and lawyer: 1584, Dec. 16—1654, Nov. 30; b. near Worthing, in Sussex. He studied at Hart Hall, Oxford, three years and (1803) became a member of Clifford's Inn, London, and (1804) of the Inner Temple; and was called to the bar. His great learning began to attract attention, and won for him the friendship of Camden, Usher, Sir Robert Cotton, and other prominent men. S. wrote his first treatise, *Analecton Anglo-Britannica*, in 1606, on the civil government of Britain previous to the Norman Conquest (published 9 years later). In 1610, appeared his *Jani Anglorum Facies Altera* (English transl. 1683), giving an account of the common and statute law of English Brittany to the death of Henry II.; and 1614, *Titles of Honor*, still an authority on its subject. His work on Semitic mythology, *De Diis Syriis, Syntagmata Duo* (1617), established his European fame as an Oriental scholar. Next year, however, he excited great indignation among the bishops by his *Treatise of Tythes*, aiming to prove that under Christianity tithes are due not by divine right, but solely because the law has imposed them. S. was assailed with diatribes, and arguments on arguments to which he was not permitted to reply—having been summoned before the privy-council and censured for his book. In 1621, he was imprisoned for advising parliament to repudiate King James's doctrine that their privileges were originally royal grants; 1623, he was elected member for Lancaster; and thereafter till his death, he took a considerable part in public affairs, yet not neglecting scholarly pursuits. S.'s political position is difficult to define. There is no doubt that his sympathy was with the popular cause and the parliament, and that he sincerely opposed the views of the court-party and the king; but S. was a constitutional lawyer, deriving his ideas of the rights of the subject from the history of the nation, and not from religious zeal or metaphysical considerations. Still, he 'loved his ease,' according to Clarendon, and so let things be done, without protest, of which he did not approve. Personally, he was rather a favorite with King Charles, for his learning and moderation. In 1629, he was committed to the Tower, for his active opposition to the illegal exactions of the court; and remained a prisoner 8 months, when he was released through the favor of Abp. Laud and the lord treasurer; 1640, he was chosen member for the Univ. of Oxford; and now, when the struggle between the king and the nation began to grow fierce, he was occasionally suspected of lacking zeal for popular liberty. He threw the weight of his learning and argument into the scale against the bishops (toward whom, like Milton and other lay-champions of freedom, he felt a peculiarly strong antipathy), when the question came up as to their tenure of seats in parliament; he was one of those who drew up the articles of impeachment against Abp. Laud, though S. does not appear to have been active in the later proceedings against that prelate; he sat as a lay-member in the Assembly of Divines at Westminster 1643, and perplexed his clerical colleagues sadly. In 1644, he was elected one of the 12 commissioners of the admiralty; in 1646, the sum of £5,000 was voted to him by parliament, in consideration of his services and sufferings for liberty; in 1647, he was appointed one of the university 'visitors,' and always used his influence to moderate the fanaticism of some of his colleagues. After the execution of Charles (which he disapproved as unlawful and inexpedient), he took little share in public matters. His death occurred in the house of Elizabeth, dowager-countess of Kent, with whom he had long lived in such intimacy that people said they were married. The principal writings of S., besides those above mentioned, are: *Marmora Arundelliana* (1629); *De Successionibus in Bona Defuncti secundum Leges Hebræorum* (1634); *De Successione in Pontificatum Hebræorum, Libri Duo* (Leyd. 1638); *De Jure Naturali et Gentium, juxta Disciplinam Hebræorum* (1640), a work more learned than critical (like most of S.'s biblical productions, who thought far too much of the opinions of the Rabbins); *De Anno Civili et Calendario Judaico* (1646); *De Synedriis et Præfecturis Hebræorum* (1650 *et seq.*); besides a great variety of posthumous works, of which the most famous, and most valuable, is his *Table-talk* (recorded and published by his amanuensis, Richard Milward, 1689). S. was highly esteemed by all his great contemporaries, both royalist and parliamentarian, for his integrity, candor, and vast erudition; but his moral courage or enthusiasm was not remarkable (except when tilting at the bishops—*then*, like Erasmus on the monks, he was quite heroic); and, on the whole, as compared with Milton, he occupies the level which Erasmus did in relation to Luther. S.'s works were collected and published at London, 3 folio vols. 1726.

SELDOM, ad. *sĕl'dŭm* [Ger. *selten;* Dut. *zelden;* Dan. *sielden;* Icel. *sjaldan*, seldom: Goth. *sildaleiks*, wonderful]: rarely; not often.

SEL D'OR, *sĕl dōr:* a salt employed in photography, originally to aid in fixing and improving the image on a daguerreotype-plate, recently for toning positive paper-proofs. It is a double hyposulphite of gold and sodium —formula $Au_2Na_6(S_2O_3)_4$. It is formed when 1 part of chloride of gold in solution is added to 3 parts of hyposulphite of soda, also in solution. The hyposulphite of soda should be always in excess during the mixture, a condition secured by adding the chloride of gold to the hyposulphite of soda, and not *vice versâ*. The salt so formed is precipitated in fine, white, crystalline needles on the addition of alcohol to the above mixed solutions; these are collected on bibulous paper, and gently dried for use. Adulterations in the commercial article, unfortunately common, may be ascertained by precipitating, igniting, and weighing the gold contained in the sample that it is desired to test. Nitric acid free from chlorine will decompose this salt, and precipitate its contained gold in the metallic form.

SELECT, a. *sĕ-lekt′* [L. *selectus*, select; *seligĕrĕ*, to choose—from *se*, aside or apart; *lego*, I choose: Sp. *selecto*, select]: picked; nicely chosen; choice: V. to take by preference from among a number; to choose; to pick out; to call. SELECT′ING, imp. SELECT′ED, pp.: ADJ. chosen from among a number; picked. SELECT′OR, n. *-ėr*, one who selects. SELECT′LY, ad. *-lĭ*. SELECT′NESS, n. *-nĕs*, state of being select or well chosen. SELECTION, n. *sĕ-lĕk′-shŭn* [L. *selectĭōnem*]: the act of choosing; things selected; a book with select pieces. SELECT′EDLY, ad. *-lĭ*. SELECT′IVE, a. *-ĭv*, exercising choice in the way of selection. SELECT′MAN, n. in *New England towns*, an officer chosen annually to manage their affairs, provide for the poor, etc. NATURAL SELECTION, that process in nature by which plants and animals best fitted for the conditions in which they are placed survive and spread, while the less fitted die out and disappear.—SYN. of 'selection': choice; option; preference; election; pick.

SELENE, *sē-lē′nē:* Greek name of the goddess of the moon; called also *Mene*, and in Latin *Luna*. Her myth is differently told, but the most common account makes her a daughter of Hyperion and Theia, and sister of Helios (the Sun) and Eos (the Dawn); as sister of Helios, called also *Phoibos* (the Shining One), she had the name *Phœbe;* and latterly was identified with Artemis (see DIANA), though the identification was never exact, as Artemis always retained her reputation for chastity, while S had 50 daughters by her lover Endymion, and several by Zeus, one of whom was called *Erse* ('the Dew'), indicating the original physical character of the myth. In Art, the two are always distinct. S. is represented by the poets with long wings and a golden diadem, riding across the heavens in a chariot drawn by two white horses, cows, or mules.

SELENITE, *sĕl′ĕ-nīt:* transparent and beautiful variety of Gypsum (q.v.), white, or tinged with green, gray, or yellow; named from its subdued moon-like lustre and transparency. It is often crystallized in six-sided prisms, sometimes in lenses; and twin crystals and quadruple crystals occur. A common form is flat twin crystals, revolved on each other so as to resemble an arrowhead or fish tail. Many-faced crystals occur loosely in soil near Pike's Peak. S. is found in common gypsum, in rock-salt, in the Blue Clay of s. England, etc. It is easily cut, and is capable of being split into extremely thin plates, flexible, though not elastic. It was used by the ancients for some of the purposes for which we use glass. The Romans imported it from Spain, Cyprus, Cappadocia, and Africa: the hot-houses of Tiberius were covered with it, and Pliny mentions that it was used in the construction of bee-hives by those who wished to watch the operations of the bees. It is used for making the finest stucco and the most delicate pastel colors. When burned and perfectly dry, its powder is used for cleansing and polishing articles of gold and silver, precious stones, and pearls.

SELENIUM.

SELENIUM, n. *sĕ-lē′nĭ-ŭm* [Gr. *selēnē*, the moon—akin to *selas*, light]: elementary substance having the appearance of lead, but brittle, and of a dark reddish-brown color, chemically allied to sulphur (see below). **Selenic**, a. *sé-lĕn′ĭk*, pertaining to or obtained from selenium—applied to an acid containing one equivalent of selenium and three of oxygen. **Seleniate**, n. *sĕ-lē nĭ-āt*, a salt of selenic acid. **Selenide**, n. *sĕl′ĕ-nīd*, a compound of selenium with a metal—same as **Seleniuret**, the latter being much less used. **Selenious**, a. *sĕ-lē′nĭ-ŭs*, applied to an acid containing one equivalent of selenium and two of oxygen. **Selenite**, n. *sĕl′ĕ-nīt* [Gr. *sĕlēnitēs*, foliated sulphate of lime]: crystallized sulphate of lime or gypsum (see below). **Sel′enit′ic**, a. *-nĭt′ĭk*, pertaining to or resembling selenite **Seleniuret**, n. *sĕl-ēn′yū-rĕt*, a compound of selenium with a metal or other elementary body. **Selen′iureted**, a. *-rĕt-ĕd*, combined with selenium. **Seleniureted hydrogen**, an ill-smelling and noxious gas.

SELENIUM, *sĕ-lē′nĭ-ŭm* (Se; old equiv. 39·5; new, 79; sp. gr. 4·28): an element having two forms. In the *vitreous* form, at ordinary temperatures, it is a solid of dark-brown color, and when broken presents a conchoidal vitreous fracture; thin splinters of it are, however, of dark-red tint when seen by transmitted light. It is tasteless and inodorous, a non-conductor of electricity.—When S. is very slowly cooled from the fused condition, its appearance is quite different; the structure being *granular* or *crystalline* (sometimes called 'metallic'). Crystalline S. is of dull leaden color; unlike the vitreous S., is very opaque to light even in thin films; and is a conductor of electricity at ordinary temperatures. Its resistance to the passage of an electric current diminishes up to the point of fusion, but suddenly increases as the S. becomes liquid. Another property of crystalline S., which has recently given it a new interest, is that it is remarkably sensitive to light; and its electrical resistance varies very much according to its exposure to light, being much less in the light than in the dark. It was in virtue of this property that the experiments were made which led 1880 to the discovery of the Photophone (q.v.).

S. remains a solid up to 392°, when it fuses into a fluid, which boils at 650°, emitting an inodorous vapor of deep yellow tint. When heated in the air, S. does not readily take fire; but it is combustible, and burns with a blue flame, while a portion of it is volatilized in red fumes. The products of combustion are oxide of S. and selenious acid.

S. is rare in nature; it is found chiefly as a selenide in combination with lead, silver, copper, or iron; but it has been discovered in sulphur also, and in certain sulphides of iron. It forms three compounds with oxygen—oxide of S., selenious acid, and selenic acid; while with hydrogen it forms seleniureted hydrogen, or hydroselenic acid.

S. was discovered 1817 by Berzelius, in the refuse of a sulphuric-acid manufactory. He named it S. [from Gr. *selēne*, the moon], because in many respects it resembled tellurium [named from Lat. *tellus*, the earth].

SELENOGRAPHY, n. *sĕl′ĕ-nŏg′ră-fĭ* [Gr. *selēnē*, the moon; *graphē*, a writing]: a description of the moon. **SELENOGRAPH**, n. *sĕl-ē′nō-grăf*, a delineation or picture of the moon's surface, or a part of it. **SEL′ENOGRAPH′IC**, a. *-nō-grăf′ĭk*, or **SEL′ENOGRAPH′ICAL**, a. *-ĭ-kăl*, pertaining to a description of the moon. **SEL′ENOG′RAPHIST**, n. *-nŏg′ră-fĭst*, or **SEL′ENOG′RAPHER**, n. *-fėr*, one who studies the character of the moon, and describes it.

SELEUCIA, *sē-lū-shĭ′a:* name of seven ancient cities of Asia; in Syria, Pisidia, Pamphylia, Cilicia, Caria, and Mesopotamia; founded during the earlier existence of the dynasty of the *Seleucidæ* (q.v.). The two most distinguished were: 1. SELEUCIA PIERIA, founded by Seleucus Nicator, on the sea-shore, about 4 m. n. of the mouth of the Orontes, and strongly fortified. It was the seaport of Antioch, and became of great importance during the wars between the Seleucidæ and the Ptolemies for the possession of Syria. It rapidly declined under the Roman dominion. The ruins have been fully explored and described in modern times by Pococke (*Observations on Syria*) and Chesney (*Royal Geographical Society's Journal*, VIII.). Its formerly magnificent port is in such good preservation as to require few repairs to render it serviceable; and the remarkable tunnel 1,088 yards in length, through the solid rock—forming the only communication between the city and the sea—and the remains of its triple line of walls, of its citadel, temples, amphitheatre, necropolis, etc., all attest its ancient importance and splendor.—2. SELEUCIA ON THE TIGRIS, also was built by Seleucus Nicator, on the w. bank of the Tigris, 40 m. (according to Strabo 33) n.e. of Babylon, which was despoiled to supply materials for the construction of the new city. Situated in a district of great fertility, commanding the great trading-routes of Assyria, Babylonia, and western Persia, it rapidly rose to great wealth and splendor, supplanted Babylon as cap. of the e. portion of the Seleucide monarchy, and when in the acme of its greatness contained a pop. of more than 600,000. Even in Strabo's time, it was larger than Antioch in Syria, the greatest commercial emporium of Asia; and till its final destruction, its pop. is said to have never fallen below half a million. During the decline of the Seleucide monarchy, it became independent, and formed, from its wealth and splendor, an irresistible bait to the robber-tribes of southern Armenia and Media, who partially plundered it more than once. But its position on the confines of Persia, which gave it its greatness, was also the cause of its destruction; for when the Seleucide monarchy was swallowed up by the Romans, and the long and desolating struggle began between the latter and Persia, S., placed between two fires, was speedily brought to ruin. It was burned by Trajan (A.D. 116), and a few years afterward by Lucius Verus; and when visited by Septimius Severus was as desolate as the mighty city which it had supplanted. Emperor Julian found the whole country round it converted into a vast marsh, the haunt of innumerable beasts of chase and wild-fowl, and the city itself completely deserted.

SELEUCIDÆ, *sē-lū'sĭ-dē:* dynasty of kings to whom fell that portion of Alexander the Great's immense and ill-compacted monarchy which included Syria, a large portion of Asia Minor, and the whole of the eastern provinces.

Seleucus I., surnamed **Nicator**, first of this line; B.C. about 358–280 (king B.C. 306–280); was son of Antiochus, distinguished officer in the service of Philip of Macedon. He was one of the conspirators against Perdiccas, and in the second partition of the provinces of Alexander the Great's kingdom, obtained Babylonia, to which, with the aid of Antigonus, he subsequently added Susiana; but a misunderstanding with that powerful chief having arisen, Seleucus took refuge in Egypt B.C. 316. The victory gained by Ptolemy over Antigonus's son Demetrius, at Gaza, having laid open the route to the East, Seleucus returned to his satrapy, amid the congratulations of his subjects, B.C. 312. Oct. 1 of this year (the date of Seleucus's return to Babylon) begins the *era of the Seleucidæ.* Having next recovered Susiana, he conquered Media, and extended his power to the Oxus and Indus. Of his campaign against Sandrocottus (q.v.) there are few details extant. In B.C. 306 he assumed the regal title; and four years afterward joined the confederacy of Ptolemy, Lysimachus, and Cassander, against the now formidable Antigonus, deciding the battle of Ipsus B.C. 301 chiefly by his cavalry and elephants. Being now, after Antigonus's death, the most powerful of Alexander's successors, he obtained the largest share in the conquered kingdom, a great part of Asia Minor and the whole of Syria falling to him. Toward the close of his reign, war broke out with Demetrius (now his father-in-law), and afterward with Lysimachus, King of Thrace and the other part of Asia Minor, both contests terminating in the defeat and death of his opponents, and being followed by his acquisition of the rest of Asia Minor. He was assassinated B.C. 280 by Ptolemy Ceraunus. Of Seleucus's personal character little can be gathered from the fragments of his history which remain; according to Pausanias, he was the most upright of Alexander's successors, unstained by those crimes which have foully blotted the characters of the others; but of his consummate generalship and great political talents we have sufficient proof. He pursued with great zeal the plan of 'Hellenizing' the East, by founding numerous Greek and Macedonian colonies in various parts of his dominions; he also built numerous cities, several of which—as Antioch in Syria, and Seleucia on the Tigris—rose to be among the most populous and wealthy in the world.—After the reigns of **Antiochus I.** (q.v.) and **Antiochus II.** (q.v.) **Seleucus II.** (reigned B.C. 246–226) surnamed **Callinicus**, obtained the throne; but having, at the instigation of his mother Laodice, murdered his stepmother Berenice, an Egyptian princess, he was driven from his kingdom by Ptolemy Euergetes (q.v.). However, he recovered his throne on Ptolemy's withdrawal; and though defeated in a great battle with the Egyptians, he maintained his hold of Syria and most of Asia Minor against both the Egyptians and his younger brother Antiochus, who exercised independent authority over part of Asia Minor. Antiochus was at a later period wholly defeated in Mesopotamia, and soon after murdered by robbers. Seleucus II. undertook a great expedition against the revolted provinces of Parthia and Bactria, but was totally routed by Arsaces I., King of Parthia; while, on the n.w., several provinces were wrested from him by Attalus, King of Pergamus.—His sons, Seleucus III. (reigned B.C. 226–223) surnamed Ceraunus, and Antiochus III. (q.v.) 'the Great,' were his successors, the latter being the first of the dynasty who came into collision with the Romans.—Seleucus IV. (reigned B.C. 187–175), surnamed Philopator, was eager to dispossess the king of Pergamus of the provinces which he had taken from the Syrian monarchy, but fear of the Romans prevented him from carrying out his design.—Antiochus IV. (q.v.), Epiphanes (I.) ('the Illustrious'), conquered Cœle-Syria and Palestine from the Egyptians, to whom they had been given by his father; but retired from Egypt at the bidding of the Romans. He practiced the most atrocious cruelties on the Jews, whose religion he endeavored to root out, and introduce the Greek religion; but the heroic resistance of the Maccabees (q.v.) completely foiled his project. He died in a state of raving madness, attributed to his sacrilegious crimes by his subjects, who in derision converted his surname into Epimanes ('the Madman').—The succeeding names of the dynasty were: Antiochus V., Eupator (reigned B.C. 164–162); Demetrius I., Soter (reigned B C. 162–150), who regained Babylon, lost Judea, and was defeated and slain by the impostor Alexander Balas (reigned B.C. 150–146); Demetrius II., Nicator (reigned B C. 146–138, 128–125), who overthrew the impostor, and was himself taken prisoner by the Parthians, Syria having been already seized by Diodotus surnamed Tryphon, who set up the puppet Antiochus VI., Theos (reigned B.C. 144–142), and afterward ascended the throne himself (reigned B.C. 142-137); Antiochus VII., Sidetes (reigned B.C. 137–128), who restored the royal line of the Seleucidæ; Antiochus VIII., Grypus (reigned B.C. 125–96), who was compelled to share his dominions with his half-brother, Antiochus IX., Cyzicenus (reigned B.C. 111–95); Seleucus V. or VI., Epiphanes (reigned B.C. 96–94); and Antiochus X., Eusebes reigned B.C. 95–83), who continued the division till B.C. 94, when the latter was victorious in a pitched battle, and seized the whole kingdom; for which, however, he was forced to fight with Philip, and Antiochus XI., Epiphanes (II.), younger brother of Seleucus V; and Demetrius III., Eucærus (reigned B.C. 94–88), a third brother of Seleucus V., who, with Philip, next claimed the sovereignty, which was taken from them by Tigranes (reigned B.C. 83–69), King of Armenia, at the solicitation of the Syrians; Antiochus XII., Dionysus, a fourth brother of Seleucus V., and Antiochus XIII. (reigned B.C. 69–65), Asiaticus. The short-lived prosperity of this dynasty, for it had begun to decline during the reign of SELEUCUS II., 80 years after its foundation, was due principally to the fatal principle on which it was founded—viz., that of establishing a Græco-Macedonian power in a foreign country, instead of conciliating the attachment of the native populations, and governing them more in accordance with the Eastern method; the consequences were the successive revolts of the natives, the foundation of the independent and hostile kingdoms of Bactria, Parthia, Armenia, Judea, and the ultimate conversion of the small remnant into a Roman province by Cneius Pompeius B.C. 65.

SELF, n. *sĕlf*, plu. SELVES, *sĕlvz* [Icel. *sjálfr;* Goth. *silba;* Dan. *selv;* Sw. *sjelf;* Ger. *selbst*, self]: one's own individual person; personality; identity; one's self, as, the fondness we have for *self;* care of personal interest; selfishness: ADJ. particular; very, as *self*-same day: preceded by the pronouns *my*, *thy*, *him*, *her*, *it*, *them*, etc., *self* forms reciprocal pronouns, as *myself; self* used as a common prefix signifies by, in, of, to, or with, one's self or itself, as *self*-acting. SELF'ISH, a. *-ĭsh*, having chiefly or solely a view to one's own interest; influenced in actions from motives of private advantage; without regard for others; egotistical. SELF'ISHLY, ad. *-lĭ*. SELF'ISHNESS, n. *-nĕs*, the quality of being selfish; attention to one's own interests, regardless of the interests of others. SELF-ABASEMENT, n. humiliation from a sense of inferiority, guilt, or shame. SELF-ACTING, a. acting by or of itself. SELF-ACTION, n. action by or originating in itself. SELF-BEGOTTEN, a. begotten by one's own powers. SELF-COMMAND, n. that equanimity of mind which enables a man in trying situations to conduct himself with coolness and prudence; self-control. SELF-COMPLACENCY, n. satisfaction with one's character, performances, etc. SELF-CONCEIT, n. high opinion of one's self; vanity; arrogance; egotism; self-will. SELF-CONCEITED, a. vain; having a high opinion of one's own importance or abilities. SELF-CONCEITEDNESS, n. an overweening opinion of one's own importance or accomplishments. SELF-CONDEMNED, a. condemned by one's own conscience. SELF-CONDEMNATION, n. condemnation by one's own conscience. SELF-CONFIDENCE, n. reliance on one's own judgment or ability. SELF-CONFIDENT, a. relying on one's own judgment. SELF-CONSCIOUS, a. unduly conscious of one's own acts or states as belonging to one's self and their effects upon others. SELF-CONTRADICTION, n. the act of contradicting itself or themselves; a proposition of two terms, one of which contradicts the other. SELF-CONTRADICTORY, a. contradicting itself or themselves. SELF-CONTROL, n. restraint exercised over one's self. SELF-CONVICTED, a. convicted by one's own consciousness or knowledge. SELF-CULTURE, n. education or training of one's self. SELF-DECEIT, or SELF-DECEPTION, n. deception that originates from one's own mistake or fault. SELF-DEFENSE, n. the act of defending one's own reputation, person, or property. SELF-DEGRADATION, n. the act or the effect of lowering or debasing one's self. SELF-delusion, n. a delusion respecting one's self. Self-denial, n. forbearance to gratify one's appetites or desires. Self-destruction, n. death by one's own hands; suicide. Self-determination, n. determination of one's own acts by one's own powers. Self-devoted, a. voluntarily devoted. Self-devotion, n. willingness to sacrifice one's self for the sake of others; self-sacrifice. Self-distrust, n. want of confidence in one's self or one's own powers. Self-educated, a. educated by one's own independent efforts. Self-elected, a. appointed or elected by one's own self. Self-enjoyment, n. satisfaction or pleasure in one's self. Self-esteem, n. high opinion of one's self; an organ so called by the phrenologists. Self-evident, a. evident without proof or reasoning. Self-examination, n. an inquiry into one's own conduct or motives. Self-existence, n. existence by one's self—an attribute peculiar to Deity. Self-existent, a. independent of any other being. Self-explaining, a. capable of being understood without explanation. Self-explanatory, a. that explains itself. Self-heal, n. the popular name of two plants, the *Prunel'la vulgārĭs*, ord. *Labĭātæ*, and the *Sanicŭla vulgārĭs*, or sanicle, ord. *Umbellif'ĕræ*, so named from their supposed curative powers Self-importance, n. exaggerated estimate of one's own merit, manifested in conduct or manners; pomposity. Self-important, a. manifesting an exaggerated estimate of one's own merits. Self-imposed, a. voluntarily taken on one's self. Self-indulgence, n. the unrestrained indulgence of one's passions, appetites, and desires. Self-interest, n. regard to one's self only. Self-interested, a. marked or prompted by personal motives. Self-love, n. love of one's own person, interest, or happiness. Self-made, a. raised in the world by one's own industry. Self possessed, a. calm; collected; having self-command. Self-possession, n. calmness and equanimity of mind. Self-praise, n. the praise or commendation of one's self. Self-preservation, n. the preservation of one's self from injury or destruction—a powerful instinct possessed by all living creatures. Self-registering, a. recording its own indications of phenomena, said of certain scientific instruments. Self-regulated, a. regulated by one's self or by itself. Self-reliance, n. reliance on one's own powers. Self-reliant, a. trusting to one's own powers. Self-reproach, n. the act of reproaching or condemning one's self. Self-respect, n. regard for one's own character and the approval of conscience. Self-restraint, n. restraint or command over one's self; self-control. Self-righteous, a. righteous in one's own esteem. Self-righteousness, n. confidence in and reliance on one's own merit or virtue—always used in an equivocal sense, indicating a want rather than actual possession. Selfsame, a. precisely the same; the very same. Self-satisfying, a. giving satisfaction to one's self. Self-seeking, a. seeking one's own interest or happiness alone; selfish: N. the act or habit of seeking one's own interest and happiness. Self-sufficiency, n. self-existence; independence of others—attributes of the Deity; a high or undue opinion of one's own strength or worth. SELF-SUFFICIENT, a. independent; capable of working out one's ends; having full confidence in one's own powers; haughty. SELF-TAUGHT, a. educated and trained by one's self. SELF-TORTURE, n. the act of inflicting pain on one's self, mentally or physically. SELF-WILL, n. obstinacy. SELF-WILLED, a. not yielding to the expressed wishes or commands of those whom we are bound to obey; obstinate. SELF-WORSHIP, n. the idolizing of one's self. *Note.*—The compounds of self are very numerous, and are mostly self-explanatory; the most common are given above.

SELF-DEFENSE, in Law: protection of one's own person or property from injury. In defending oneself a person may lawfully employ just so much violence as is 'necessary,' even to the taking of life. Constructively, it is self-defense for a husband or a wife to repel an assailant of either, and the same is to be said of parents and children, master and servant. If two persons on sudden provocation enter into combat, and in the fight one of them is killed, the slayer is guilty at least of manslaughter, unless he can prove that before dealing the fatal blow he had refused further combat, and had retreated as far as he could with safety. Of course one is not acting in necessary self-defense who pursues and kills an aggressor from whom he is no longer in danger.

SELF-DENYING ORDINANCE: in Eng. history, a measure carried through parliament 1645 by the influence of Cromwell and the Independents, with the view of removing Essex and the Presbyterians from control of the army. It was moved by a fanatic of the name of Zouch Tate, who, on the ground that 'there is but one way of ending so many evils, which is, that every one of us freely renounce himself,' proposed that 'no member of either house shall, during this war, enjoy or execute any office or command, civil or military, and that an ordinance be brought in accordingly.' The ordinance, which was clearly intended to take the executive power out of the hands of the more moderate politicians, and form an army independent of parliament, was the subject of violent and protracted debate, but eventually passed in both houses, and became law. The consequence was that Essex, Warwick, Manchester, and others gave in their resignation, and the conduct of the war was intrusted to Fairfax; Cromwell, to whom, as a member of the lower house, the self-denying ordinance extended, as much as to Essex and the rest, had the duration of his commission prolonged by the commons on account of his invaluable services as a leader of cavalry, and by his brilliant achievements soon surpassed his commander in reputation.

SELF-HEAL: see PRUNELLA (plant).

SELFISH, SELFSAME: see under SELF.

SELFRIDGE, *sĕl'frĭj,* Thomas Oliver: naval officer b. Boston, 1804, Apr. 24. He became a midshipman in the U. S. navy 1818, and after his promotion as lieut. 1827 he served in foreign waters; commanded the flag-ship of the E. India squadron 1845–6, was connected with the Pacific squadron in the war with Mexico, and was severely wounded at Guaymas, was for several years at the Boston navy-yard, was connected with the Gulf squadron, and commanded the Mississippi for a short time early in the civil war, but on account of his wound was obliged to leave the sea: and was in charge of the navy-yard on Mare Island 1862-65. Admiral Selfridge served at dif. periods on the examining board, and as lighthouse insp. at Boston. He became capt. 1885, commo. 1862, rear-admiral 1866, and was retired 1866. He died 1902, Oct. 15.

SELIM, *sē̆'lĭm,* I., Sultan of Turkey; 1467–1520, Sep. 22 (reigned 1512–20); son of Bajazet II. He dethroned his father by aid of the Janizaries, 1512, and ascended the throne. To secure himself in his elevation, he caused his father, brothers, and nephews to be put to death, thus beginning a policy which he pursued inflexibly through his whole subsequent career, viz., to destroy without scruple every actual or possible obstacle to the accomplishment of his ends. Urged on by a devouring appetite for conquest, and by the warlike fanaticism of the Janizaries, he declared war (1514) against Shah Ismaïl of Persia, and marched eastward with an army of 250,000 men, massacring on the way 40,000 Shiites. He encountered Ismail at Calderoon, and defeated him with immense loss; but a spirit of disaffection breaking out in his army, he was compelled to content himself with this success, which gave him possession of Diarbekir and Kurdistan. In the following year, he overran Armenia; and leaving his lieutenants to complete this conquest, he marched against the Mameluke sultan of Egypt, whom he had previously endeavored to detach from intimate alliance with the Persian monarch. Kansû-ghori, the Egyptian sultan, was totally defeated (1516) at Marjabik by S., and Syria became the prize of the victor; and Kansû's successor, Touman-Bey, was still more unfortunate, his army being almost extirpated (1517) at the battles of Gaza and Rudania. The victorious Turks then entered Cairo without opposition; Touman-Bey and his chief supporters were put to death, and Egypt incorporated with the Ottoman empire. The last lineal descendant of the Abbaside caliph, who was then resident in Egypt, transmitted to S. the religious prestige which had devolved on himself by descent, and at the same time bestowed on him the title 'Imaum,' and the standard of the Prophet. In consequence of this gift, the Ottoman sultan became the chief of Islam, as the representative of Mohammed; and the sacred cities of Mecca and Medina, with the chief Arabian tribes, in consequence acknowledged his supremacy. Thus, in less than four years, S. did more to extend the Ottoman empire than any of his most renowned predecessors during a whole reign. He also laid the foundation of a regular marine, constructed the arsenal of

Pera, chastised the insolence of the Janizaries with savage severity, and labored to ameliorate, by improved institutions, the condition of the various peoples he had conquered. He died while planning fresh campaigns against both Persians and Christians. This prince, who in a sense merited his title of *Yavuz* (the Ferocious), was nevertheless a lover and encourager of literature, and even cultivated the poetic art. S. was succeeded by his son, Solyman the Magnificent (q.v.).

SE'LIM III., Sultan of Turkey; 1761, Dec. 14—1807 (reigned 1789–1807); only son of Mustapha III. He ascended the throne on the death of his uncle, Abdul-Hamid, and entered on a policy of renovation and progression; but the war with Russia, in which his newly raised army of 150,000 men was totally defeated, first by the Prince of Coburg, and next by Suwarof, stayed his schemes of reform. He was compelled 1791 to cede Choczim to Austria, and in the following year, all his possessions beyond the Dniester to Russia. About this time, his harmony with Napoleon was troubled by the expedition of the French to Egypt, and subsequently by the question of the recognition of the French empire; but on the whole, S. continued the faithful ally of France; and at every opportunity pursued with ardor his various reforms, establishing cannon-foundries, and organizing a body of troops ('the Nizam-Djedit') armed, clothed, and disciplined in European fashion; but this last reform stirred up against him (1805) all the fanatic bigotry of his subjects. The priests of Islam even preached revolt in different parts of the empire, and accused their sovereign of despising the holy injunctions of the Koran; and at length a formidable rebellion broke out in which the Nizam-Djedit were overpowered and the rebels marched into Constantinople, their ranks being swelled by bodies of disaffected Janizaries. All those who had favored or forwarded the sultan's schemes were seized and put to death, and S. was compelled to issue a decree suppressing the new institutions, and soon thereafter to resign the throne to his cousin, *Mustapha IV.* (reigned 1807–8). On the arrival of Mustapha-Bairaktar, the pasha of Rustchuk, one of the sultan's chief advisers, who had marched upon Constantinople, with a view to reinstate S. on the throne, the monarch was strangled, and his body cast at the feet of Bairaktar: see BAIRAKTAR. With S. perished the first attempt at reformation in Turkey.

SELIMNO, *sā-lĭm'nō:* manufacturing town of European Turkey, in E. Roumelia, at the s. base of the Balkan Mts. 78 m. n. of Adrianople. Owing to its far inland position there is little communication between the town and the coast, consequently the annual fair held here is of very great importance. Arms, cloth, and attar of roses are manufactured. Pop. 15,000.

SELJUKS, *sĕl-jôks'*, or SELJUK-TURKS: offshoot of the Hoei He or Hoei-Hu, a collection of tribes of Turkish race, who, being driven southwestward from the Chinese wall, had in 744 overwhelmed that Turkish empire of Kiptchak which had given so much annoyance to the Sassanidæ (q v.) during their reign in Persia. The Hoei-Hu rapidly extended their power from the Caspian Sea as far as the Hoang-ho, and at the time when the S. separated themselves from them were ruled by a chief named Bigû Khan. Seljuk, from whom the S. derived their name, was chief of a small tribe which had gained possession of Bokhara and the surrounding country. His sons, attracted by the beauty and fertility of Khorassan, began, about 1027, to migrate to that country, and after struggles with the Ghiznevide sultans established themselves in n. Khorassan, with TOGRUL BEG, eldest grandson of Seljuk, as their chief, and Nishapur as capital. Togrul, leaving his brother in Khorassan, set out on his conquering march, subdued Balkh and Khaurezm 1041, Irak-Ajemi 1043, subsequently adding Kerman and Fars. He then advanced to Bagdad, which he took 1055, dethroning the last vizier of the Dilemite (see SAMANI) dynasty, and being invested by the reigning caliph with the vacant office; after which he completed his conquest of Persia by the reduction of Irak-Arabi and Mosul about 1061. The S. were zealous Mohammedans, and Togrul Beg built numerous mosques, subsidized pious and learned men, and treated the caliph—his spiritual chief—with profound respect. After his death 1063, his nephew, ALP-ARSLAN (q. v.), succeeded to supreme power, and became one of the most renowned monarchs of Asia. His son, MELEK SHAH (reigned 1073–93), the most powerful monarch of this dynasty, added, by means of his generals, Arabia, Asia Minor, Armenia, Syria and Palestine, and Transoxiana to his empire, which now extended from the Hellespont to the borders of Chinese Tartary; and even the ruler of Cashgar acknowledged his authority. This empire, though extensive and ill-compacted, was preserved in order and prosperity by his able minister, the virtuous Nizam-ul-Mulk, under whose firm and wise government the rights of all classes were maintained, religion promoted, and learning encouraged, till the Persians, who had dreaded the conquest of their country by the Turks as the worst of evils, were forced to confess that it had proved the greatest of blessings. In 1092 Melek Shah, lending an ear to the misrepresentations of Nizam ul-Mulk's enemies, deprived him of his office; and the aged minister was soon assassinated by one of the followers of Hussun Subah, chief of the Assassins (q.v.), the mortal enemy of the good ex-vizier. Hospitals, caravansarais, bridges, roads, and canals attest the zeal with which the commercial interests of the empire were furthered; while the colleges of Bassora, Ispahan, and Herat, the law-college of Bagdad, and the observatory (first in Asia) of the same city, indicate the care given to literature and science. Melek Shah, under whom the empire of the S. had attained the height of its power and splendor, laid a sure foundation for its rapid decline, by subdividing it into a number of separate principalities, all professedly subject to the central state of Iran or Bagdad. The chief principalities were: 1. The central state of *the S. of Iran,* whose ruler was the vizier of the caliph, and exercised direct authority over n. and w. Persia to the borders of the Arabian desert. The chief monarchs of this branch were Mohammed Shah, whose generals warred with the Crusaders in Palestine, and Sultan Sanjar, one of the most celebrated of the Seljuk princes, great both in success and in misfortune: this branch was annihilated 1194 by the shah of Khaurezm. 2. *The S. of Kerman,* annihilated 1191 by the Ghuz Turkomans. 3. *The S. of Iconium,* who ruled over Asia Minor, and whose founder was Soliman, great-grandson of Seljuk: this branch endured 1075–1299; and was engaged in numerous wars with the Byzantines and with the Crusaders, both of whom learned to dread its power. During its last years, it was tributary to the Mongols; and 1299 the present Turkish empire rose on the ruins of its power (see OTHMAN). 4. *The S. of Aleppo,* who ruled from 1079 till their extinction 1114. 5. *The S. of Mosul,* speedily supplanted by *attabegs,* or independent governors, of whom Zenghi and his renowned son, Noureddin (q.v.), were most celebrated. 6. *The S. of Damascus,* offshoot (1096) from the Aleppo principality, which lasted till 1155, when it was ended by Noureddin. 7. *The S. of Mardein,* who appear in common history only as allies of the S. of Iconium, Mosul, Aleppo, and Damascus, against the mighty crusading armies of w. Europe. 8. *The S. of Khaurezm* (*Khiva*), who founded a great empire, including the whole country within the Jaxartes, the Bolor Mountains, the Indus, the Sea of Oman, and the Persian Gulf; but the last monarch, Allah-ed-din Mohammed Shah, having wantonly put to death some Mongol merchants who were pursuing their avocations within his dominions, was doomed to destruction by the terrible Genghis Khan (q.v.), who crossed the Sir-Daria, conquered Transoxiana, defeated Mohammed's armies, and drove the shah himself to take refuge in an island of the Caspian, where he died. The advance of the Mongols was gallantly opposed by Mohammed's renowned son, Jelal-ed-din, who twice defeated them; but being totally routed (1221), on the w. bank of the Indus, by Genghis himself, he plunged his horse into the Indus, and safely reached the opposite bank, none of his enemies daring to follow him. The whole of this extensive empire then fell under Mongol domination.

SELKIRK, *sĕl'kĕrk:* Scottish royal burgh, cap. of the county of S.; 40 m. by the N. British railway s.s.e. of Edinburgh; on an eminence overlooking Ettrick Water and the famous field of Philiphaugh, where Gen. David Leslie defeated Montrose and crushed the cause of King Charles in Scotland. The county buildings, the old town-hall, and the monuments to Sir Walter Scott and to Mungo Park, are the principal architectural features. S. has large woolen-mills. Tweeds, hosiery, and blankets are the chief articles of manufacture. S. commands a splendid view across the valley in which the Ettrick and Yarrow meet. It is within a few miles of many famous localities, and is a favorite starting-point for tourists exploring the ‘Scott’ country, the ‘Forest,’ the Yarrow, and St. Mary's Loch. The manufacture of ‘single-soled shoon’ long flourished here, and the ‘Souters of Selkirk’ have place in Scottish song.—Pop. (1881) 6,090; (1891) 5,788.

SEL′KIRK (or SEL′CRAIG), ALEXANDER: see JUAN FERNANDEZ.

SEL′KIRK SETTLEMENT: see MANITOBA.

SELKIRKSHIRE, *sĕl′kėrk-shėr*, in ancient times called Ettrick Forest: county in Scotland, bounded by the counties Midlothian, Roxburgh, Dumfries, and Peebles, on the n., e., s., and w. respectively; length from n. to s. about 28 m.; breadth from e. to w. 16 to 18 m.; consisting mainly of the two parallel valleys through which flow the rivers Ettrick and Yarrow; 260 sq. m., or 166,524 acres. It is mostly a pastoral county, and some of the hills are above 2,000 ft. in height. The hills are rounded at the top instead of peaked, and are covered generally with grass, affording excellent pasturage, but in some places with heather. The arable land is about 300 to 800 ft. above sea-level, and is about one-eighth of the area. The banks of several streams are beautifully wooded; but the extensive woods from which the county originally took its name of the Forest have disappeared. The average of produce is above that of most of the other counties. This county contains some historical scenes, besides the field of Philiphaugh. Oakwood Castle, in ruins, was the residence of the famous wizard Michael Scot and Newark, also in ruins, was the residence of Anne, Duchess of Buccleuch, where the *Lay of the Last Minstrel* is represented by Scott as having been sung. The Douglas family, four centuries ago, were the principal proprietors of S.: the Duke of Buccleuch now holds about two-thirds of it. Pop. (1871) 18,572; (1881) some territory having been annexed, 25,654; (1891) 27,349; (1901) 23,356.

SELL, v. *sĕl* [Icel. *selia;* Dan. *sælge;* AS. *sellan*, to transfer, to deliver: Icel. *sala*, delivery, bargain]: to give or transfer to for a price; the opposite of *to buy;* to part with for an equivalent; to have traffic; to betray for a reward; in *slang*, to cheat; to deceive: N. in *slang*, a deception; a take-in. SELL′ING, imp. SOLD, pt. and pp. *sōld*, did sell; given to for a price. SELL′ER, n. *-ėr*, one who sells. TO SELL ONE'S LIFE DEARLY, to cause great damage and loss to those who are taking or seeking one's life. TO SELL ONE'S SELF TO EVIL, to do wrong without restraint.

SELL, or SELLE, n. *sĕl* [F. *selle*, a saddle—from L. *sella*, a seat—from *sedērĕ*, to sit]: in *Scot.*, a stool; seat; in *OE.*, a saddle; a throne.

SELLANDER, n. *sĕl′ăn-dėr*, or SELLENDER, n. *sĕl′ėn-der* [F. *solandre*, an ulcer in the leg of a horse]: a dry scab in a horse's hock or pastern, due to lack of cleanliness.

SELMA, *sĕl′ma:* city, cap. of Dallas co., Ala.; on Alabama river, and on the Birmingham Selma and New Orleans, the East Tennessee Virginia and Georgia, the Louisville and Nashville, the Mobile and Birmingham, and the Western Alabama railroads; 50 m. w. of Montgomery, 160 m. n.n.e. of Mobile. It is at the head of steamboat-navigation on the river, is in a noted cotton-growing district, and is the centre of a large trade in cotton, lumber, iron, and coal. It contains co. court-house, 18 churches, 2 academies, several public, parochial, and private schools, 1 national bank (cap. $400,000), 2 state banks, and 2 daily and 3 weekly periodicals. During the civil war it was an important milit. post of the Confederates, who held it till 1865, Apr. 2. Pop. (1880) 7,529; (1890) 7,626; (1900) 8,713.

SELTERS WATER, *sĕl′terz* (commonly but incorrectly written *Seltzer Water*): mineral water named from the village of Lower Selters near Limburg, in the duchy of Nassau, where several springs united, in one basin, yield 5,000 cubic ft. an hour of this sparkling and effervescing mineral water. Its chief ingredients are carbonic acid, carbonate of soda, and common salt. It acts as a mild stimulant of the mucous membranes and as a diuretic; and is applied in chronic disorders of the digestive, respiratory, and urinary organs. It is recommended as a beverage in cases of liver complaint, and in hot climates and seasons. More than 1½ millions of jars or bottles of this famous water are exported yearly to all quarters of the world. The spring was discovered early in the 16th c., but was at first so little prized that in the middle of the 18th c. it was rented for 4*s*. The water is little drunk at the spring. Artificial Selters Water is extensively manufactured on a large scale and for domestic use. See AËRATED WATERS.

SELTZER WATER, n. *sèlts′ér waw′tér:* mineral water from *Selters*, in Nassau, Germany. *Note.*—The correct spelling is SELTERS WATER (q.v.).

SELVAGE, n. *sĕl′vāj*, or SELVEDGE, n. *sĕl′vĕj* [O.Dut. *selfegge*, the selvage: a corruption of *self-edge*—that is, that which makes an edge of itself without hemming]: the border or edge of cloth which is formed in weaving it. SEL′VAGEE′, n. *-vă-jē′*, in a *ship*, flexible rope composed of yarn not twisted together, but bound together by other yarn or marline. SEL′VAGED, a. *-vājd*, or SEL′VEDGED, a. *-vĕjd*, having a selvage.

SELVAS: see SILVAS.

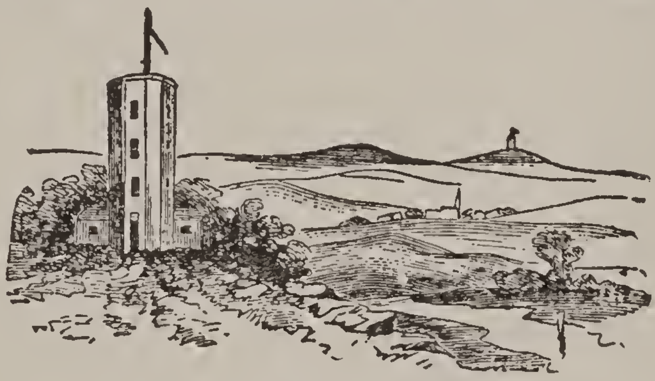
SELVES, *sĕlvz:* plu. of SELF, which see.

SELWYN, *sĕl′wĭn*, GEORGE AUGUSTUS, D.D.: 1809–1878, Apr. 12; b. Richmond, Surrey, England. He studied at Cambridge; was tutor at Eton, and for a little while rector at Windsor; and was consecrated 1841 first missionary bp. of New Zealand. After long and faithful service in this field, he became 1867 bp. of Lichfield. In 1874 he visited Canada and the United States. He published *Are Cathedral Institutions Useless?* (1838); *Sermons* (1842);

Tribal Analysis of the Bible (1855); and *The Work of Christ in the World* (1855). He died at London. His *Life,* by the Rev. H. W. Tucker, appeared 1878.

A memorial fund which was started soon after his death grew in four months to about £16,000, and was applied to the founding of SELWYN COLLEGE, in Cambridge Univ.: 19th college in the order of establishment in the university. At this institution a university education can be acquired at a very moderate cost, and there is rigid adherence to the principles and doctrines of the Established Church. The college was founded 1882, and in 1887 had 3 scholars and 89 undergraduates.

SEMAPHORE, n. *sĕm'ă-fōr* [Gr. *sēma,* a sign; *phoros,* bearing]: mechanical device for telegraphing by means of signal-posts; that which conveys signs or signals. The S. was in use for telegraphy before the application of the electric current. The system was established first by the French 1794, for conveying intelligence from the capital to the armies on the frontier: it was introduced into England 1795. These semaphores consisted of towers at intervals of 5 to 10 m., on commanding sites. On the top of each tower was the telegraph apparatus, which at first comprised 6 shutters arranged in 2 frames, by the opening and shutting of which, in various combinations, 63 distinct signals could be formed. In 1816 this was changed to a mast with 2 arms, similar to many of the present railway signals: the arms were worked from within the tower by winches in the look-out room, where a powerful telescope in either direction constantly commanded the mast of the next station. The S. has given place to the electric telegraph. In calm weather, when flags will not extend, semaphores are employed on board ship for signalling: on land almost their only use is as a track-signal in connection with the block-system on railroads.—See SIGNALS.

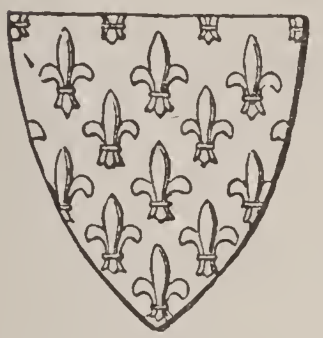

Semaphore.

SEMATOLOGY, n. *sē-ma-tŏl'o-jĭ* [Gr. *sēma, sēmatos,* a sign]: doctrine of signs, especially of verbal signs, in the operations of thinking and reasoning; the science of language as expressed by signs.

SEMBLABLE, a. *sĕm'blă-bl* [F. *semblable,* like—from *sembler,* to seem—from L. *simulārĕ,* to seem; *simĭlĭs,* like]: in *OE.,* like; resembling: N. representation; likeness. SEM'BLABLY, ad. similarly.

SEMBLANCE, n. *sĕm'blăns* [F. *semblance*, resemblance; *sembler*, to seem—from L. *sĭmĭlĭs*, like]: likeness; appearance; show; figure. Sem'blant, a. in *OE.*, having the appearance of anything; like: N. resemblance; show; figure. Sem'blative, a. in *OE.*, suitable; resembling; fit.—Syn. of 'semblance': likeness; resemblance; similarity; similitude; representation; appearance; show; figure.

SEMÉ, a. *sĕm-ā'* [F. *semé*, sown—from *semer*, to sow]: in *her.*, strewn or powdered over with figures, as stars, crosses, etc.: *aspersed* or *powdered* are sometimes used in this meaning. Semé of cross crosslets is termed *crusilly*, and of billets *billety*.



Semé.

SEMECARPUS, *sĕm-ē-kâr'pŭs:* genus of trees of nat. order *Anacardiaceæ*. The Marking Nut of India is *S. anacardium*, a tree 50 ft. high, growing on mountains. The swollen receptacle of the flower becomes a succulent fruit, eatable when roasted, but astringent and acrid when raw. On the receptacle is seated the nut, heart-shaped and black, consisting of a kernel—not unwholesome, though rarely eaten—surrounded by two skins, between which is a black acrid juice. This juice is used in medicine as an external application to heal rheumatism, etc. It is also in general use in India for marking cotton cloth; and the color is improved, and running prevented, by addition of a little quicklime and water. The wood of the tree contains so much acrid juice that it is dangerous to work upon.

SEMEIOLOGY and SEMEIOTIC: see Semiology, etc.

SEM'ELE: see Bacchus.

SEMEN, n. *sē'mĕn* [L. *sēmen*, seed—from *sero*, I sow: It. *seme*]: the seed of animals; sperm; the seed of flowering plants. Seminal, a. *sĕm'ĭ-năl*, of or belonging to seed; radical; germinal; in *bot.*, applied to the cotyledons or seed-leaves. Sem'ina'tion, n. *-nā'shŭn*, the act of sowing; in *bot.*, the natural dispersion of seeds.

SE'MENCINE—SE'MEN CIN'Æ—SE'MEN CON'TRA: see Artemisia.

SEMENDRIA, *sē-mĕn'drē-â:* frontier fortress of the principality of Servia (q v.), on the Danube, 28 m. s.e. of Belgrade; ancient seat of the Servian kings. It has been frequently the scene of battle.—Pop. 6,578.

SEMES'TER, *sĕmĕs'tėr*, n. [Fr. *semestre*; Lat. *semestris*, from *sex*, six and *mensis*, month]: a college half-year, about five months, measuring the fall or the summer course in various universities.

SEMI-, *sĕm'ĭ* [L. *semi*, half]: a common prefix, signifying 'half; half of; in part; partially': the compounds of *semi* are for the most part easily understood, if the meaning of the latter part is known: a hyphen is usual after *semi*.

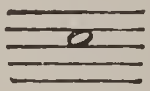
SEMI-ACID, a. *sĕm'ĭ-ăs'ĭd* [*semi*, and *acid*]: half acid.

SEMI-AMPLEXICAUL, a. *sĕm'ĭ-ăm-plĕks'ĭ-kawl* [*semi*, and *amplexicaul*]: in *bot.*, embracing the stem half round, as a leaf.

SEMI-ANATROPAL, a. *sĕm'ĭ-ăn-ăt'rō-păl* [*semi*, and *anatropal*]: in *bot.*, half-anatropal—applied to ovules.

SEMI-ARIAN, n. *sĕm'ĭ-ā'rĭ-ăn* [*semi*, and *Arian*]: in *eccles. hist.*, one who embraced some of the principles of the Arians, and disguised others under milder terms.

SEMI-BARBARIAN, a. *sĕm'ĭ-bâr bā'rĭ-ăn* [*semi*, and *barbarian*]: only partially civilized.

SEMIBREVE, *sĕm'ĭ-brēv*, in Music: note of half the duration of the breve of old ecclesiastical music, but the longest note in use in modern music. It is represented by a character circular or elliptical in form , and is adopted as the integer or measure-note, the other notes—minim, crotchet, quaver, etc.—being proportional parts of it.

SEMICIRCLE, n. *sĕm'ĭ-sér'kl* [*semi*, and *circle*]: half a circle; the part of a circle separated by the diameter. SEM'ICIR'CLED, a. *-sér'kld*, formed as a semicircle. SEMICIRCULAR, half-round.

SEMICOLON, n. *sĕm'ĭ-kō'lŏn* [*semi*, and *colon*]: in written or printed composition, the point or character (;) used to mark a longer pause than a comma, or to mark off a clause or member of a sentence.

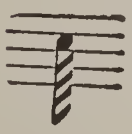
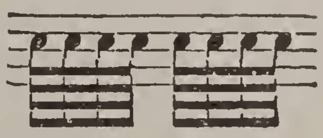
SEMI-COLUMNAR, a. *sĕm'ĭ-kō-lŭm'nėr* [*semi*, and *columnar*]: in *bot.*, flat on the one side and round on the other.

SEMI-CONSCIOUS, a. *sĕm'ĭ-kŏn'shŭs* [*semi*, and *conscious*]: imperfectly conscious.

SEMI-DEISTICAL, a. *sĕm'ĭ-dē-ĭs'tĭ-kăl* [*semi*, and *deistical*]: bordering on deism.

SEMI-DIAMETER, n. *sĕm'ĭ-dī-ăm'ĕ-tėr* [*semi*, and *diameter*]: half the diameter; the radius of a circle.

SEMI-DIAPASON, n. *sĕm'ĭ-dī'ă-pā'sŏn* [*semi*, and *diapason*]: an imperfect octave; an octave diminished by a lesser semitone.

SEMI-DEMI-SEMIQUAVER, *sĕm'ĭ-dĕm'ĭ-sĕm'ĭ-kwā'vėr*, in Music: note of which 8 are equivalent to a quaver, 32 to a minim, and 64 to a semibreve. It is represented thus, , or in groups thus, 

SEMI-DOUBLE, a. *sĕm'ĭ-dŭb'l* [*semi*, and *double*]: in *bot.*, having the outermost stamens converted into petals, while the innermost stamens continue perfect.

SEMI-FLEXED, a. *sĕm'ĭ-flĕkst* [L. *semi*, half; *flexus*, bent—from *flecto*, I bend]: half-bent.

SEMI-FLOSCULAR, a. *sĕm'ĭ-flŏs'kū-lėr*, or SEMI-FLOSCULOSE, a. *-kū-lōz* [*semi*, and *floscular*]: in *bot.*, having all the florets ligulate, as in the dandelion.

SEMI-FLUID, a. *sĕm'ĭ-flô'ĭd* [*semi*, and *fluid*]: imperfectly fluid.

SEMI-JUDAIZERS, n. *sĕm'ĭ-jû'da-īz-ėrz:* in *chh. hist.*, a sect of Socinians, founded by Francis Davides, a Hungarian, who denied that prayer or any other religious worship should be offered to Jesus Christ.

SEMILOR, n. *sĕm'ĭ-lawr* [prefix *semi-;* F. *or*, gold]: alloy for cheap jewelry, etc., consisting of copper five parts and zinc one part.

SEMI-LUNAR, a. *sĕm'i-lô'nėr* [*semi*, and *lunar*]: half-moon-shaped.

SEMINAL and SEMINATION: see under SEMEN.

SEMINARY, n. *sĕm'ĭ-nėr-ĭ* [L. *semĭnārĭum*, a nursery-garden—from *sēmen*, seed—from *sero*, I sow: It. *seminario;* F. *séminaire*]: a seed-plot; a place of instruction or education; a school; a college. SEM'INARIST, n. *-ĭst*, or SEM'INA'RIAN, n. *-nā'rĭ-ăn*, a priest instructed in the tenets of the Rom. Cath. Chh. in a foreign seminary.

SEMINIFEROUS, a. *sĕm'ĭ-nĭf'ėr-ŭs* [L. *sēmen*, seed; *fero*, I bear]: secreting and conveying the seminal fluid; in *bot.*, bearing seed.

SEMINOLES, *sĕm'ĭ-nōlz:* tribe of Amer. Indians, originally a vagrant branch of the Creeks, whose name, Seminole, signifies wild or reckless. In 1705 they aided in driving the Appalaches from Florida; and 1817 they joined with the Creeks and some negro slaves who had taken refuge with them, ravaging the white settlements in Georgia, plundering plantations, and carrying off slaves, whom they refused to surrender. Gen. Jackson, who was sent to punish them, took at the time several Spanish forts, and hastened the negotiations which ended in the cession of Florida to the United States. At this cession 1823 the S. engaged to retire into the interior, and not molest the settlers; but as the fugitive slaves continued to take refuge with them, a treaty was made with some of the chiefs, 1832, for removal of the whole tribe w. of the Mississippi. This treaty was repudiated by the tribe at the instigation of Osceola (q.v.), one of their chiefs; and a war commenced against a handful of savages, which lasted eight years, and cost thousands of lives, and ten millions of dollars. The savages made their refuge in the interminable and—except to the initiated—impassable swamps of Florida, whence it was almost impossible to dislodge them. In the end, the remains of the tribe were removed to the Indian Territory, on the borders of Arkansas.

SEMI-NUDE, a. *sĕm'ĭ-nūd* [*semi*, and *nude*]: partially nude; half-naked.

SEMIOLOGY, n. *sē-mĭ-ŏl′ō-jĭ* [Gr. *sēmei′on*, a mark, a sign; *logos*, a discourse]: that branch of medical science which teaches how to judge of all the symptoms exhibited by the human body, whether they indicate health or disease: *symptomatology* is now used in the same sense. SE′MIOT′IC, a. *-ŏt′ĭk*, or SE′MIOLOG′ICAL, a. *-ō-lŏj′ĭ-kăl*, relating to the symptoms or signs of diseases. SE′MIOT′ICS, n. plu. *-ĭks*, used in same sense as SEMIOLOGY.

SEMI-ORDINATE, n. *sĕm′ĭ-ŏr′dĭ-nāt* [*semi*, and *ordinate*]: in *math.*, the half of an ordinate.

SEMIOTIC, SEMIOTICS: see under SEMIOLOGY.

SEMIPALATINSK, *sā-mē-pâ-lâ-tĭnsk′:* extensive Russian province in central Asia, bounded e. and s. by Tomsk, the Chinese empire, and Turkestan; 184,631 sq. m. It is traversed by several mountain chains. Its topography is little known. The chief rivers are the Irtish, Ili, and Chui; and among the lakes are Lake Zaisan (80 m. long, 10–20 wide, shallow, but with depth for steam-navigation), Issik-Kul, Ala-Kul, and Balkash. The country is rapidly drying up. Cattle form almost the sole wealth of the inhabitants, though the precious metals, with lead and copper, are found. Steamers ply on some of the great rivers and lakes.—Semipalatinsk, the cap. (pop. [1897] 26,356), on the left bank of the Irtish, lat. about 50° 15′ n., is the seat of an imp. transit-trade.—Pop. province (1897) 685,197.

SEMI-PALMATE, a. *sĕm′ĭ-păl′māt* [*semi*, and *palmate*]: in *zool.*, having the feet only partly webbed down the toes.

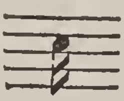
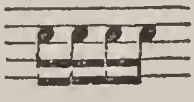
SEMIPED, n. *sĕm′ĭ-pĕd* [L. *semi*, half, and *pes* or *pedem*, a foot]: a half foot—applied to verse. SEMIPEDAL, a. *sĕm-ĭp′ĕ-dăl*, containing half a foot.

SEMI-PELAGIANISM, *sĕm′ĭ-pē-lā′jĭ-an-izm:* modification, as the name implies, of the doctrine of the Pelagians as to the powers of the human will, and as to the effects to be attributed to the action of the supernatural grace of God, and of the divine decree in the predestination of the elect. The Pelagians (q.v.), discarding altogether the doctrine of the fall of Adam, and the idea that the powers of the human will had been weakened through original sin, taught that man, without any supernatural gift of the Spirit of God, is able, by his own natural powers, to fulfil the entire law, and to do every act necessary for attainment of eternal life. The condemnation of this doctrine by several councils early in the 5th c. is capable of various constructions; and has been urged by some to the extreme of denying altogether the liberty of man, and converting the human will into a merely passive instrument, whether of divine grace on the one hand, or of sinful concupiscence on the other. The writings of St. Augustine on this controversy have been differently construed by the different Christian communions (see PELAGIANISM); and the same diversity of opinion existed in his own day. Among those who, dissenting from the extreme view of Pelagius, at the same time did not go to the full length of the Augustinian writings in opposition to Pelagius, were some monks of the s. provinces of Gaul, especially of Marseille, whence their school was called Massilian, from the Latin name (*Massilia*) of that city. Of these leaders, the chief was a priest named Cassian, who had been a deacon at Constantinople. Of the system which he propounded, without going into the curious and interesting details, it is enough to say that it upheld the sufficiency of man's natural powers only so far as regards the first act of conversion to God and the initial act of man's repentance for sin. Every man naturally possesses the capability of beginning the work of self-conversion; but for all ulterior acts, as well as for the completion of justification, the help of God's grace is indispensable. The Semi-Pelagian doctrine is often confounded with that of the Molinistic (see MOLINA) school of Rom. Cath. theology; but there is one essential difference, viz., that the latter persistently maintain the necessity of grace for all holy acts, even for the beginning of conversion; though they are generally represented as agreeing with the Semi-Pelagians as to the mode of explaining the freedom of the human will acting under the influence of divine grace. The chief writers in the controversy were Prosper, Hilary, and Fulgentius; and the question was referred to Celestine, Bp. of Rome 431. It continued to be agitated in the West for a considerable time. Faustus, Bp. of Riez toward the end of the 5th c., revived the error; and it was condemned in a council at Arles 475, and in a synod (the second) at Orange (Arausio) 525, and again in the third council of Valence 530.

SEMI-PENNIFORM, a. *sĕm'ĭ-pĕn'nĭ-fawrm* [L. *semi*, half: *penna*, a feather; *forma*, shape]: in *anat.*, applied to certain muscles bearing some resemblance to the plume of a feather.

SEMIPLENA PROBATIO, *sĕm'ĭ-plē'nâ prō-bā'shĭ-ō*, in Scotch Law: that kind of half-proof, half-suspicion—a species of *prima-facie* evidence—which when admitted by the court in a few doubtful cases was eked out by the oath of the party, called an Oath in Supplement. The Oath in Supplement is now in effect discarded.

SEMI-QUADRATE, n. *sĕm'ĭ-kwŏd'rāt* [*semi*, and *quadrate*], or SEMI-QUARTILE, n. *kwawr'tĭl* [*semi*, and *quartile*]: in *astrol.*, the aspect of two planets when distant from each other 45° or half a quadrant.

SEMIQUAVER, n. *sĕm'ĭ kwā'vėr* [*semi* and *quaver*]: in *music*, note represented thus,  or in groups thus,  equivalent in value to $\frac{1}{2}$ of a quaver, $\frac{1}{4}$ of a crotchet, $\frac{1}{8}$ of a minim, or $\frac{1}{16}$ of a semibreve. SEMIQUAVER, v. to sound or sing in semiquavers.

SEMIQUIETISM, *sĕm′ĭ-kwī′ĕt-ĭzm:* form of mystical asceticism which, while it adopts the theoretical principle that the most perfect state of the soul is that of passive contemplation, and denies, in certain conditions of the soul, the necessity of prayer or other active manifestations of virtue, yet maintains the incompatibility of this passive contemplation with any external sinful or sensual action. The Semi-Quietists thus differed from the grosser sectaries referred to under QUIETISM.

SEMI-QUINTILE, n. *sĕm′ĭ-kwĭn′tĭl* [*semi*, and *quintile*]. in *astrol.*, the aspect of two planets when they are distant from each other 36°.

SEMIR′AMIS: see ASSYRIA.

SEMI-SAVAGE, n. *sĕm′ĭ-săv′āj* [*semi*, and *savage*]: one who is half-savage; one imperfectly civilized.

SEMI-SEPARATISTS, n. *sĕm′ĭ-sĕp′a-ra-tĭsts:* in *chh. hist.*, name given in the 17th c. to certain persons who would listen to the sermons of clergymen of the Established Church, but would not be present during the prayers.

SEMI-SEXTILE, n. *sĕm′ĭ-sĕks′tĭl* [*semi*, and *sextile*]: in *astrol.*, the aspect of two planets when they are distant from each other 30°.

SEMI-TERTIAN, a. *sĕm′ĭ-tėr′shan* [*semi*, and *tertian*]: compounded of a tertian and quotidian: N. a low fever; a kind of ague.

SEMITIC, a. *sĕm-ĭt′ĭk*, or SHEMITIC, a. *shĕm-ĭt′ĭk:* pertaining to *Shem*, son of Noah, or to his time or his descendants (see SEMITIC LANGUAGES: SEMITIC NATIONS). SEMITE, n. *sĕm′īt*. descendant of Shem. SEM′ITISM, n. *-ĭt ĭzm*. one of the peculiar forms of the Semitic languages (see SEMITIC PLURAL). *Note.*—In Hebrew, the name from which the adjective is derived is spelled *Shem;* but, as in many other cases, the *sh* of the original was transformed by the Septuagint into *s* (see SHIBBOLETH); hence, through the influence of the modern versions that have in this respect followed the Septuagint, the form *Semitic* is more current than *Shemitic*.

SEMITIC LANGUAGES, *sĕm-ĭt′ĭk:* general name of a number of dialects, supposed at one time to have been spoken by the descendants of Shem. The term is of recent origin (Schlözer, Eichhorn), and a misnomer; for, in the first place, not all the nations derived in Genesis from Shem spoke an idiom akin to those understood by the term Semitic (e.g., the Elamites, Lud, etc.); and, on the other hand, Canaan and Cush, whose Semitic speech is undoubted, are there traced to Ham. S. L., however, as a 'conventional appellation,' is still the best of all the general terms hitherto proposed (Arabic; Syro-Arabic, analogous to Indo-Germanic).

The family of S. L., which spread originally over Canaan (Phœnicia and Palestine), Assyria, Aram (Syria, Mesopotamia, Babylonia), and Arabia, and later over part of Asia Minor and the Punic northern coast—i.e., from the countries on the Mediterranean to the Tigris, and from the Armenian Mountains to the s. coast of Arabia—may broadly be divided into three principal classes: 1. The Aramaic or Northern (n.e.) dialect, comprising chiefly the so-called Chaldee and Syriac; 2. The Southern, the chief representative of which is the Arabic, closely allied to whose older (Himyaritic) form is the Ethiopic; 3. The Middle, or principally Hebraic, to which belong also the languages of the other Palestinian inhabitants, those of the Canaanites and Phœnicians above all. The difference between the Middle and Northern branches is less sharply marked than between the Middle and the Southern or Arabic.

Before treating of them individually, we consider their general position among other languages; and principally the salient points of difference between the Semitic and that other most important family, Indo-European or Aryan languages. First, then, we notice the preponderance given in Semitic to the consonants in distinction from the vowels. The consonants are indeed the basis and the body of its words. The vowels are more or less accessories, modifying, fixing, making precise the meaning, but never themselves containing it, while in the Indo-European languages the root itself consists generally of a combination of vowels and consonants. A further peculiarity is the prevailing 'triliteralness' of Semitic roots in the advanced stage in which we now know them. The Indo-European languages derive their wealth from the logical law of their composition of roots, of verbs, and particles; the Semitic add to their store in phonetically multiplying their sounds: either by splitting, as it were, their single consonants into two or more, through reduplication of radicals, or by adding new consonants to the primary root, which is thus developed often from a monosyllabic (for by far the greatest number of Semitic roots consisted primarily of two consonants only, to which a third was generally added at a later period) into a root of five letters. Compound words are of utmost rarity both in the noun (except proper names) and in the verb, and they never consist of combined roots of verbs and particles, but of verbal and nominal roots. Regarding the formation of cases, tenses, and all those other grammatical changes of noun and verb which, in the Indo-European family, are wrought—as far as the verb or noun itself is concerned—almost exclusively by suffixes, while the radical vowel changes merely according to euphonic rules within its own limited sphere, the Semitic languages principally and chiefly work their flexions by a change of vowels within the radical consonants, leaving the latter themselves intact. Only when these changes suffice no longer for the more elaborate modes of speech and thought, supplementary letters and syllables are sought in aid, and a certain small number of prefixes or affixes represents the vast and varied groups of little words (amounting at times to whole phrases) of the Indo-European. The Semitic languages are also, if poorer, less complicated in forms than the former family. There are only two genders—which, however, are distinguished also in the second and third persons of the verb—and two principal tenses. These are strongly marked by the position of the personal pronoun, represented by a suffix in the so-called perfect and by a prefix in the so-called aorist or imperfect (future). The former expresses the finite, the completed action, the fact; the latter, the incompleted action, the thought, that which is becoming, growing into a fact. One of the most curious features is the sudden change that may be produced in the two by a certain prefixed conjunctive-consonant. Perfect then becomes future, and *vice versâ*. Declension, in the Indo-European sense, exists, if at all, in an extremely limited sense in Semitic. The juxtaposition of two words (with slight vowel-changes) forms the genitive, while the other cases (in the Hebraic at least) are formed by prepositions. The oblique cases of pronouns are indicated by suffixes. The syntax is of the crudest and simplest kind: a mere stringing together of sentences without any particular attempt at logical and methodical arrangement of periods, according to their temporary superior or inferior relation to the subject matter.

Another most important distinction between the two families is formed by what has been called their lexical difference, i.e., the lack—except in a few isolated cases—of any correspondence or identity in their individual words. Most of those words which show a similarity either have been adopted at a late period, or they simply fall under the category of onomatopoetic words (words imitating the sound of the object expressed, and therefore showing in all cases greater or smaller affinity to the original sound); or, again, words in which the common type of human language would involuntarily, and under all circumstances, connect a special meaning with a special sound, and would, therefore, be more or less identical in all idioms. Of words introduced into European languages by Semitic (Phœnician) traders may be instanced, *kanua* = cane, *gamal* = camel, *mor* = myrrh, *kezish* = cassia, *ahelim* = aloe, *nerd* = nard, *carkon* = crocus, *sappir* = sapphire, *sak* = sack, etc. Of onomatopoetic terms, *lakak* =(Skr. *lih*) to lick, *charat* (Skr. *charîdan*) = to grate, scratch, *galal* = to roll, *parak* = to break, etc. On the other hand, words have crept into

Semitic from foreign languages; e.g., the Egyptian, *ior*, *iero*, *iaro*, river, Nile, is found as *yeor* in Hebrew, *pardes* (Heb.) paradise, is Persian, *kop* (Skr. *kapi*) is the Heb. for ape, *karpas* (Skr. *karpâsa*) = wool, cotton, etc.

As regards the age of the family of Semitic languages, it is matter of great doubt whether or not they were developed earlier than any other, e.g., the Indo-European. The monuments that have survived are not sufficient for us to form a final judgment as yet. It stands to reason, however, that a development may have taken place simultaneously and independently in the idioms of other nations. The notion long cherished (and still upheld by a few isolated speculators) that Hebrew was the original language of all mankind till the episode of the tower of Babel, may here be passed over without remark. See PHILOLOGY.

We now endeavor to draw an outline of the relation of the Semitic languages among themselves, and to cast a rapid glance at their individual characteristics and history, referring for fuller details to the titles of special branches indicated. Although the Semitic languages are clearly sister dialects, their relationship is far from being so close as, e.g., that of the different Greek dialects. Thus Abraham, belonging by his descent to a people of Semitic tongue, and coming from a country where Semitic was the general language, at his arrival in his new place of abode, inhabited by Semites, was considered, and considered himself, a foreigner to a much greater extent than would have been the case had a Greek emigrated from one part of Greece into another. It would be more fit perhaps to institute a comparison between the different Semitic dialects and the Germanic languages among themselves: German, Dutch, Danish, Swedish, Norwegian, etc.; or the Slavonic idioms: Lithuanian, Lettish, Russian, Polish, Bohemian. But even these are not so far removed from each other as the Semitic idioms. What the latter have in common are those grammatical and other characteristics indicated above, and the *root-words* themselves, which nearly everywhere have the same original signification; only that in this respect the Arabic shows by far the largest development of meanings out of the single roots, and consequently an unparalleled wealth of derivatives. Yet it must not be forgotten that our relics of ancient Hebrew are scanty, and that the Arabic has remained a living language until our day, and has, through Islam, spread further than any ancient and perhaps even modern language.

Regarding the vexed question as to which of the Semitic languages is the oldest, it must be confessed that no positive result has yet been attained. For though the oldest palpable monuments of Semitic have survived in Hebrew, while our earliest documents in Aramaic date from Cyrus, and those in Arabic, even centuries after Christ (Himyaritic, Ethiopic. 4th c.; northern Arabic, 6th c.), yet we cannot now decide which of these has preserved the type of the original mother-tongue most intact. It sometimes happens that vast internal movements, or a series of events in the history of a people—wanderings, wars, and the like—change, quicken, and develop its language even to decay, before it has had time to beget a literature. When this time does arrive, we meet already with all the traces of this decay in imperfections, corruptions, and archaisms of form. Thus, the Hebrew of the Bible, i.e., the most ancient form in which it has survived, offers more grammatical analogies (in incomplete structure, inflection, etc.) to the modern than to the ancient Arabic, which lasted in its primitive purity and fulness of form as long as the simple life of the dwellers in the desert was not broken by those events which upheaved, from the time of Mohammed, their whole existence, and brought them in closest and most violent contact with other nations of other tongues. Then that process of decomposition, or phase of negligence and corruption, set in, which resulted in the looseness exhibited by modern Arabic. It thus reached the downward stage of the Hebrew of the Old Test. at ever so much later a period. Arabic classical literature thus exhibits, compared with the Hebrew, and even more with the Aramaic —which we meet in a worse state of aged and crippled organism and stunted form—about the same vigor, freshness, and fulness of form and structure, which the Skr. exhibits among the Indo-European or the Gothic in the narrower circle of the Germanic dialects. With all this, however, we cannot absolutely decide in favor of the Arabic as the nearest approach to the original type. The phase in which it enters into our historical horizon may be as far removed from it even as the Aramaic, perhaps further. Its hasty individual development may have quickened more radical changes than even the decaying or decayed other branches present. So that, as we said, for the present at least, the question of priority must remain open. We shall, however, allot the first place to the second or Southern Semitic (Arabic) class, simply because of its copiousness of words and development of forms. A faint trace of its peculiarity of article (*al*) is supposed to be found in Gen. x. 26 (*Almodad*); but this seems fallacious, considering that the Hebrew article must have been originally the same, and the word may simply exhibit the ancient Hebrew form. In the golden epoch of Hebrew literature, Arab culture does indeed seem to have stood in high renown—Solomon's wisdom is likened unto that of the Arabs, Queen Sheba is an Arab queen, and Job's friends are Arabs. On its peculiar history and development, however, we cannot here dwell. (See ARABIAN LANGUAGE AND LITERATURE.) Suffice it to observe generally that Arabic is not only the richest of Semitic, but one of the richest of all languages, with its more than 6,000 word-roots and about 60,000 words; while the Hebrew has about 2,000 word-roots and 6,000 words. The 22 consonants of the Aramæans, and the 23 of the Hebrews, have been augmented into 28 with the Arabs. They further have twice the number of the Hebrew regular conjugations, in which, again, the latter exceed the Aramaic by one. The same abundance is noticeable in the Arabic tenses, declensions, etc. The general wealth of this language, however, will be best appreciated from its possessing about a thousand different terms for a sword, and a proportionate number of words for lion, serpent, and the like; while, on the other hand, its adaptibility and versatility are shown by one word often possessing a vast number of meanings. Anciently, it had two principal branches: the Himyaritic, spoken in the south, which has perished almost completely (a few partly mutilated inscriptions, recently brought to the Brit. Museum, were published some time ago, and their interpretation has been attempted by Osiander and Levy in the *Germ. Or. Society's Transactions*); and the Koreishite, which, being the idiom of Mohammed's tribe, became *the* paramount Arabic for all times. The Ethiopic (see ETHIOPIA) is by some investigators held to have flowed from the Himyaritic; but from the 14th c., the Amharic dialect (also Semitic, but with little capacity for writing purposes) has superseded the Ethiopic almost completely.

The North Semitic or Aramaic, to which we now turn, is the language of the whole district between the Mediterranean and the Tigris, s. of the Taurus, n. of Phœnicia, the Israelitish territory, and Arabia. Here we have again to distinguish between Syria Proper, Mesopotamia (between Euphrates and Tigris), and Babylonia (s. of Mesopotamia), whither the Israelites were carried by Nebuchadnezzar. Yet, with respect to Babylonia, it can hardly be doubted that another dialect besides the Aramaic was spoken in it. But whether this was 'Medo-Persian' ('like the Assyrian'), or some other 'Turanic' idiom, largely mixed with Semitic ingredients, must remain doubtful until our knowledge of 'Turanian' and our reading of cuneiforms shall have advanced further. There is, however, but one voice among competent investigators, that whatever strange elements the Babylonian and Assyrian languages may contain, they have full claim to be reckoned among the Semitic. The Aramaic in general is, as has been observed before, poorer than the Hebrew in grammatical forms, vowels, etc., besides having a peculiar tendency to blunting its consonants, changing its soft *s* into *d*, *ts* into *t*, *sh* into *th*, and the like. It further does not express its article by a prefix, but by an *Alef*, and it forms its passives, not by change of vowels, but by a special syllable prefixed to the root. The first distinct trace of a difference between Hebrew and Aramaic is seen in Gen. xxxi. 47, where it is found necessary to translate Laban's designation of the stone-heap erected in memory of his peace with Jacob. Although the ancient Babylonians had probably a rich and important literature, yet nothing of it has survived. The so-called Babylonian fragments supposed to have come down in Arabic translations are a mere fiction. All the Aramaic literature which we possess is derived from the Jews, and of very late date The Babylonian exiles, both those who returned to Palestine and those who stayed in the land of their captivity, made Aramaic their habitual language. It was the common tongue of Palestine at the time of Christ, the Hebrew being then chiefly the 'holy language'—i.e., the language of temple and synagogue. Thus, the Semitic words used in the

New Test. are one and all Aramaic (Mammon; Raka; Eli, Eli, etc.; Talitha Kumi; Abba; etc.), and the same may be said of the Semitic terms found in Josephus. The oldest remains in this idiom (variously called Hebraisti, Arami, Sursi, Chaldee) are certain portions of the Old Test. (Daniel, Ezra, etc.), the Targums (q.v.), the Mishna (to a certain extent, at least), the Talmuds, and the Midrashim. Idiomatic shades are again observable in these different documents; but while, as a living language, it was spoken and pronounced differently in the different districts of Palestine and Babylon, yet the special subdivisions into special provincial dialects which have been attempted can hardly be said to be correct. From the 2d c., Christian writers, chiefly in Mesopotamia, Edessa, Carrhæ, Nisibis, began to use this language in their writings, principally theological (Translation of the Bible) and dogmatical, but which also treat of medicine, history, philosophy, mathematics, etc. Yet their Aramaic assumed a character so essentially different that, in some respects at least, it became an entirely distinct dialect, viz., Syriac, which, at a later period, assumed also—to make the breach complete—an alphabet of its own (Estrangelo). Many have been the attempts to account for this strange difference (whose very existence was, on the other hand, almost totally denied at one time), but with no satisfactory result. Certain it is that the mere geographical reasons (East and West Aramaic, etc.) do not hold good, and are arbitrary and fallacious. The Syriac, as a living language, ceased to be spoken since the 10th c., and only a few Syrian Christians in Kurdistan and Mesopotamia are supposed to use a kind of vulgar Aramaic. Syriac literature ceased about three centuries later. As the language of the church, however, it is still in use with the Jakobite, Nestorian, and Maronite branches of the Syrian Church. Minor sister dialects of Aramaic are the Samaritan, a corrupt Judæo-Aramaic mixed with Arabic words; the Zabian or Nazaræan (Mandaic); the language of a theosophical sect ('disciples of John the Baptist') standing between the Syriac and Chaldee, and mixed with Persian, but bearing altogether the stamp of an uncouth, ungrammatical, sadly neglected idiom; further, the Palmyrene (Palmyra), which, with a written character closely akin to the square Hebrew, offers but little variations from the Syriac; and finally, the Ægypto-Aramaic, which is found on a few monuments (Stone of Carpentras, Papyri), and probably belongs to Jews who at a late period had immigrated into Egypt, and had adopted the Egyptian religion. Its words are principally Judæo-Aramaic, but with large infusion of foreign elements.

The third principal branch, the Middle Semitic, which comprises Hebrew and Phœnician (Punic)—and all the questions connected with these—are discussed under JEWS and PHŒNICIA (see those titles). See also ARABIAN LANGUAGE AND LITERATURE: ARAMÆA: ETC.

SEMITIC NATIONS, or SEMITES, *sĕm'īts:* various nations considered as descendants of Shem. Generally comprised under this name are the Assyrians, the Chaldæans or Babylonians, the Syrians, Phœnicians, Hebrews, Arabs, and Ethiopians: see these several titles. It remains here only to add a few observations on the characteristics ascribed to them all in common, and on their influence on the history and development of humanity. As regards the language, the poverty of the inflections, the well-nigh absolute impossibility of expressing abstract ideas, the general absence of compound verbs and substantives, and the primitive state of the syntax in the Semitic, as contrasted with the wealth and vigor of the Aryan, see SEMITIC LANGUAGES. From this arises, as an almost natural consequence, the general inferiority of Semitic literature—to what we emphatically call 'classical literature.' Certain most important forms of Indo-European poetry, e.g., are completely lacking in the Semitic, such as the epopee and the drama; though, on the other hand, the peculiar ancient form of Arabic poetry—the Kasida—and the grand bursts of pathos found in the religious books of the Hebrews, are vainly sought in Indo-European literature. Again, a primitive state of Law seems to have developed among the Aryan nations, the chief characteristic of which was a recognition, albeit dim, of individual rights, as far as they did not war against the complex unity of the 'State.' With the Semites, in the absence of that talent for organization and conciliation which is so essential a mark of the Indo-Europeans, we find either a patriarchal, an anarchical, or a despotical kind of government. Science and philosophy, in the larger sense of the words, are the almost exclusive property of the Aryans. The inferiority of the Semites in these respects, however, is amply counterbalanced by the sublime place that they take as the ethical teachers of all humanity. How the hard and narrow egotism which, not quite unjustly, is ascribed to them, ever came to bear and ripen those grand moral maxims with which we meet in the earliest Jewish records, and which, wrought up to their purest idealism, form the shining glory of the New Test., is a problem of which some seek the solution in a peculiar *intensity* of character inherent in the Semitic races; while others account for it by direct 'Inspiration' from the living God. The same may be said of that Monotheism which belonged, in the first instance, to the Hebrews out of all the nations of the earth. It is a grave mistake, however, to describe, as Renan does, the Semites indiscriminately as monotheists. Babylon and Assyria, and Syria or Phœnicia, and the ante-islamic Arabs, were neither more nor less polytheistic than the early or present inhabitants of India. And, we may well add, not before the return from the Babylonian exile are the Jews themselves, as a whole nation, to be considered as real monotheists. Only by a slow process through many generations was Israel educated up to the pure monotheism of their early laws and institutes, out of their original idol-worship, and against the tremendous pressure of the world-wide paganism amid which they stood—a single nation bearing alone the treasure of a pure faith. But ever since that exile, both they, and, from the time of Mohammed, the Arabs, have been the representatives of a more austere and exclusive dogma of the unity of the godhead than a great part of the civilized world has found good to accept up to this day. Both Christianity and Islam, the most powerful religious agents, one for nearly 2000 years, the other for about 1200, are in their origin Semitic; and their influence need not here be enlarged upon. For what we owe to the Semites in the field of industry and inventions, and the civilization which they carried with them wherever they went, see PHŒNICIA. Also, it is to be remembered that the very Alphabet itself is of Semitic origin.

SEMIT'IC PLURAL: in Semitic languages, particularly Hebrew, a use of the plural where other languages use only the singular. This is particularly the case in terms of space and time—their vastness being conceived as a multiplicity. Thus, certain regions, like Heaven—which, through the influence of the Bible language, is also with us sometimes used *pluraliter*—'Heavens,' the expanse of water; further, the place at a person's head or feet, or even certain limbs of the body (conceived as space), like neck, face, etc.; or, again, periods of times, like youth, age, life, and special *lasting* qualities or states, like barrenness, blindness, mercifulness, and the like, are put in plural number, where the English uses the singular only. It is further applied to might and strength, as consisting originally of a multiplicity of elements of power. This is shown particularly in the word ELOHIM (q.v.), = a Unity of many 'Mights'—i.e., the Supreme Being. The false conclusions as to the plurality of the Divine Persons being proved by this word are refuted by the occurrence of the plural in the word Master (Adon), Lord (Baal), when these stand unmistakably for a single human individual, and are meant to express merely his proprietorship of some object or other.

SEMITONE, n. *sĕm'ĭ-tōn* [*semi*, and *tone*]: in *music*, a 'half-tone'; one of the smallest intervals in the diatonic scale, as E F or B C, in which the ratio is as 15 to 16.—In the pianoforte, the interval between any two notes between which no other note is interposed, as C to C sharp or B flat to B, is a semitone.

SEMI-TRANSPARENT, a. *sĕm'ĭ-trăns-pā'rĕnt* [*semi*, and *transparent*]: half or imperfectly transparent.

SEMI-VOCAL, a. *sĕm'ĭ-vō'kăl* [*semi*, and *vocal*]: half-vocal; imperfectly sounding; pertaining to a semi-vowel.

SEMI-VOWEL, n. *sĕm'ĭ-vow'ĕl* [*semi*, and *vowel*]: a sound intermediate between a vowel and a consonant, as, *l*, *m*, *n*.

SEMLER, *sĕm'lėr*, JOHANN SALOMO: one of the most influential German theologians of the 18th c., called sometimes 'the father of German rationalism' (see RATIONALISM): 1725, Dec. 18—1791, Mar. 14; b. Saalfeld, where his father was archdeacon. He was educated at Halle; and 1749 went to Coburg as prof. at the gymnasium. In 1751 he was appointed a prof. of theology at Halle, where he taught with great success; and six years later became director of the theol. seminary there. S., early in his student-career, was somewhat of a Pietist, but the prelections of Sigm. Jak. Baumgarten may be said to have revolutionized his religious convictions, and swung him round to rationalism, of which he was the pioneer. S.'s rationalism, however, was always moderate in *degree*, though definite in *kind*. As a thinker, he was deficient in philosophical consistency and breadth of view; as a writer, he had no literary skill or grace; but his works are valuable for their new spirit of historical criticism. As a biblical critic, though not definite and clear in details, he illustrated some principles long overlooked: he distinguished between theology and religion; between the provincial and temporal, and the fundamental and universal in historical Christianity; between individual beliefs, and the public testimony of the combined church in creeds. He recalled the forgotten fact that the traditional canon of Scripture was not set forth by divine authority. The absolute identification of the Bible with revelation, he denied, also the strict theories of a perfect verbal inspiration. Toward the end of his career, he saw the need of a conservative check on the spirit of general criticism which he had aroused.—His principal works are: *Apparatus ad liberalem Veteris Testamenti Interpretationem* (Halle 1773), *Abhandlung von der Untersuchung des Kanons* (4 vols. Halle 1771–75), *De Dæmoniacis* (Halle 1760), *Umständliche Untersuchung der Daemonischen Laute* (Halle 1762). *Versuch einer Biblischen Daemonologie* (Halle 1776), *Selecta Capita Historiæ Ecclesiasticæ* (3 vols. Halle 1767–69), *Commentationes Historicæ de Antiquo Christianorum Statu* (2 vols. Halle 1771–2), *Versuch Christlicher Jahrbücher oder ausführliche Tabellen über die Kirchengeschichte bis aufs Jahr.* 1500 (2 vols. Halle 1783–86), *Observationes novæ, quibus Historia Christianorum usque ad Constantinum Magnum illustratur* (Halle 1784) —See his *Lebensbeschreibung von ihm selbst verfasst* (Halle 1781–2), Schmid, *Theologie Semler's* (1858), and Tholuck in *Vermischte Schriften.*

SEMLIN, *sĕm lēn':* frontier town of Austria, in the Croatian-Slavonian Frontier (till of late the Military Frontier); on a tongue of land at the junction of the Save and Danube, on the right bank of the Danube, opposite Belgrade. Recently the town has been much improved, though even yet a suburb of mud huts thatched with reeds stretches along the Danube. The only noteworthy edifices are the churches, the German theatre, and the Lazaretto (*Contumaz*), the chief quarantine station in the whole of the Military Frontier. At this institution, travellers crossing from Turkey are compelled to remain for a time—sometimes 40 days—in proportion to the violence and proximity of the plague. The principal Lazaretto is here because S. is the great seat of the Turco-Austrian transit-trade, and the principal ferry for passengers from the land of the Moslem to Christendom. Pop. (1880) 9,500. —For a graphic notice of S., see Kinglake's *Eothen.*

SEMMERING, *sĕm'mėr-ĭng:* mountain on the borders of Styria and Austria, 44 Eng. m. s.w. by w. from Vienna; 4,416 ft. above sea-level. The Vienna Grätz and Trieste railway has been carried across this mountain by a series of ingenious engineering contrivances. See GLOGGNITZ.

SEMMES, *sĕmz*, RAPHAEL: American naval officer: 1809, Sep. 27—1877, Aug. 30; b. in Charles county, Md. In 1828 he entered as midshipman in the U. S. sloop-of-war *Lexington*, and was in the service as passed midshipman and lieut. until 1855, when he attained the rank of commander. In 1858, he was appointed sec. to the Lighthouse Board; but resigned 1861, Mar. 26; joined the naval service of the Confederate States; was sent by Jefferson Davis to N. Y., Conn., and Mass., to visit the principal workshops, and to buy and ship to the south all kinds of munitions of war. On his return he was appointed to command the war-steamer *Sumter*, in which he captured 18 merchant vessels. For the career of Capt. S. until the sinking of his famous ship, the *Alabama*, by the U. S. war-steamer *Kearsarge*, see ALABAMA, THE. Capt. S., with 13 officers and most of his men, was rescued from drowning by the yacht *Deerhound*, and taken to England, where he expected to take command of one of two rams built at Liverpool for the Confederates, but which were seized by the British govt. He returned to America, was included in the final surrender, and was elected judge of probate at Mobile, Ala.; but, being prohibited by the Federal authorities, he was, 1866, appointed prof. of moral philos. in a southern university. He published the *Cruise of the Alabama and the Sumter* (1864); and *My Adventures Afloat* (1869).

SEMNOPITHECUS, *sĕm-nō-pĭ-thē'kŭs:* genus of monkeys, natives of the East, having a very long, slender, powerfully muscular, though not prehensile tail. The canine teeth are long, but the molar teeth are more tuberculous than in Gibbons (q.v.) and other allied monkeys, indicating a greater aptitude for vegetable food. With this the structure of the stomach corresponds, which is very remarkable, and different from that of all other animals; consisting of a cardiac pouch, slightly bifid at the extremity; a very wide middle portion, formed of numerous pouches or sacs; and a very long canal, furnished with sacs at its commencement, but simple toward its termination. Prof. Owen has pointed out that these three portions do not correspond to any of the parts of the stomach of a ruminant animal, not exhibiting any such diversities in internal surface. The species are numerous: the Entellus Monkey (q.v.) is one; another is the Negro Monkey (*S. Maurus*) of Java, remarkable for jet-black color and long silky hair.

SEMOLINA, n. *sĕm'ō-lē'nă* [It. *semolino*, a kind of paste for soups—from *semola*, bran—from L. *sĭmĭla*, the finest wheat-flour: F. *semoule*, sand-like wheat-meal]: the fine hard parts of wheat rounded by attrition in the millstones; article of food much used in France and Italy; consisting of particles of wheat varying in size from grains of sand to small millet. Only the hard-grained wheats of Spain, Odessa, and s. Italy are adapted for making it; these hard wheats are not easily reduced to flour; and the small particles which escape being crushed by the millstones, and will not pass through the sieves, constitute S. In France, more attention is given to S. than in any other country; and as it fetches a higher price than flour, the skilful miller adjusts his millstones to produce a considerable quantity. The granules of S. are of various sizes, and they are carefully separated by sieves with openings from fine to coarse. A favorite bread made of the coarser kinds of S.—the semoule of the French—is sold in Paris under the name *gruau*. In Italy. S. is used in making polenta, with maize, meal, and millet; in Britain it is used for puddings.

SEMOULE, n. *sĕ-môl'* [F.]: same as SEMOLINA (q.v.).

SEMPACH, *sĕm'pâch:* small town of Switzerland, canton of Lucerne, 9 m. by railway n.w. of the town of Lucerne, on the e. shore of the Lake of Sempach; pop. little more than 1,000. It is surrounded with walls, now ruinous, and was one of the outposts of the confederated cantons against their Swabian and Austrian assailants in the 14th c.—Under the walls of S. was the second great conflict of the confederated Swiss cantons with Austria. Leopold's army of 4.000 horse and 1,400 foot arrived before S. 1386, July 9, and found itself unexpectedly opposed by the confederated Swiss to the number of 1,300. The nature of the ground being unfitted for cavalry, the knights dismounted and formed themselves into a compact body, which was at once charged by the Lucerners; but the wall of steel was impenetrable, and not a man of the Austrians was even wounded, while 60 of the bravest of Lucerne, with their landamman, fell. The mountaineers were beginning to despair of making an impression on their apparently invulnerable opponents, when Arnold von Winkelried, a knight of Unterwalden, seized with a noble inspiration, rushed forward, grasped with outstretched arms as many pikes as he could reach, buried them in his bosom, and bore them by his weight to the earth. His companions rushed over his body into the breach thus made, slaughtered the armor-encumbered knights like sheep, and threw the remainder into confusion and dismay. The result was a decisive victory for the Swiss. who had lost only 200 men; while the loss of the Austrians was ten times as great, including 600 counts, barons, and knights. The body of Duke Leopold, who had throughout displayed obstinate valor. was found next day buried among a heap of slain. The anniversary of this great victory is still celebrated by prayer and thanksgiving on the field of battle.

SEMPER, *sĕm'pėr*, Gottfried: architect: 1803, Nov 29—1879, May 15; b. Hamburg. He received his early education at Altona and Hamburg, and later studied mathematics, particularly in relation to milit. science, at Göttingen. He studied architecture at the Univ. of Munich 1825–6, and at Paris under Gau 1827–30; then travelled in Italy, Sicily, and Greece. He became prof. of architecture in the Dresden Academy 1834. In Dresden he was architect of the opera-house, the museum and picture-gallery, a synagogue, and other notable buildings, in which he gave expression to his artistic ideas of a classic decorative style. He was implicated in the revolutionary troubles of 1848, and had to flee from Saxony. He was appointed teacher of the principles of decoration in the S. Kensington Museum, London, at its opening 1852, became prof. of architecture at Zurich 1853, and built the new polytechnic school there, besides a hospital, etc.; was called to Dresden 1871 to rebuild the opera-house, built by him before his exile, and destroyed by fire 1869. S. was a leader in the practice of polychrome in architecture: his German writings on color, ancient plastic art, etc., have done much to restore the ancient union between architecture, sculpture, and painting. S.'s English lectures, on art in metals and hard materials, are unpublished. His son, Hans S., has written on Tuscan sculpture.

SEMPERVI'VUM: see House-leek.

SEMPITERNAL, a. *sĕm'pĭ-tĕr'năl* [F. *sempiternel*, sempiternal—from L. *sempiter'nus*, perpetual—from *semper*, always]: having beginning, but no end; endless; eternal; everlasting. Sem'piter'nity, n. *-tėr'nĭ-tĭ*, endless duration in the future.

SEMPRE, ad. *sĕm'prā* [It.—from L. *semper*, always]: in *mus.*, ever, always, throughout: used with some other mark to signify that such mark is to remain in force until a new direction appears.

SEMPSTER, n. *sĕm'stėr* [see Seam 1]: one who works with the needle. Semp'stress, n. *-strĕs*, a woman who works with the needle. Semp'stressy, n. *-strĕs-ĭ*, the occupation of a sempstress.

SEN: ancient Egyptian town: see Esne.

SEN, *sĕn*, Keshub Chunder, *kĕsh'ŭb chŭn'dėr*, Babu leader of the Brāhmo-somāj (q.v.) or native theistic society of India: 1838–84. He was of the Vaidya or merchant caste, and, while a student in the Presidency College, Calcutta, discarded much of his ancestral religion. Joining the Brāhmo somāj, he gave it new impetus and form. Its first stage, under its original founder, Rammohun Roy (d. 1833), has been termed the Vedantic, because, while rejecting idolatry, it regarded the Vedas as infallible, and favored transmigration and the doctrine of *Nirvâna.* The second stage, named the Puranic, followed the Purana sacred books and practice in worshipping the Godhead alone, and teaching the separate being of God and the human soul; it dates from about 1840, when Babu Debendra Nath Tagore became leader of the progressive party in the society. The third or eclectic stage was introduced by Babu Sen, and took distinct form, with secession of conservatives, when, 1865, he demanded on behalf of his party that badges of caste be discarded, men only of pure life employed in religious services, and tolerance be entertained toward other religions—Brahmoism to be an eclectic and universal faith. The Bible was accepted in common with other sacred books, and the Lord Jesus was received as the wisest and best of men; but incarnation and mediation were rejected as inconsistent with human equality and freedom. In a remarkable lecture at Calcutta 1879, Sen said, 'Christ rules British India, not the British government. If unto any army appertains the honor of holding India for England, that army is the army of Christian missionaries, headed by their invincible captain, Jesus Christ.' Doctrines especially recognized by the society are the Divine Fatherhood and Presence, Providence, the Communion of Saints, and Immortality. Since 1879, a fervent devotional spirit has been developed; but, with it, a singular spiritist doctrine and practice of the 'communion of saints;' pilgrimages are made to rooms where, not outwardly, but in the soul of the devotee, the spirits of Moses, Socrates, scientific men, and certain Hindu saints are supposed to give audience annually, each on a certain day. New ceremonies, and new forms of Christian ordinances, have been introduced. Monogamy, the marriage of Hindu widows, female education, and temperance are advocated. A theol. institution, a library, a large school for boys, and many periodicals were established before the death of Babu Sen.

SENAAR, or SENNAAR, *sĕn-nâr'* (properly SENNAR); anciently known as the *Island of Meroe, mĕr'ō-ē:* country of e. central Africa, bounded n. and n.e. by Upper Nubia, e. and s.e. by Abyssinia, s. and s.w. by Soudan or Nigritia, and w. by the Bahr-el-Abiad or White Nile, which separates it from Kordofan; extreme length 350 m.; average width 120 m.; 40,000 sq. m. It consists of two physically distinct divisions, one well wooded and well watered, called Jezirat el-Jesirat ('Isle of Isles'), between the Blue Nile and the Rahad; the other, the 'island' of Sennar proper, between the two main rivers, which is almost a level plain, though beyond Sennar, the old capital, it rises into rocky ridges and elevations of several thousand feet. The level plain has an alluvial soil which would, after the periodical rains, if well cultivated, yield rich crops of cotton, tobacco, maize, pulse, sesame, and durra, though the last is the principal product. The forests of the wooded portions include the tamarind tree, from which bread is made, ebony, dye-woods, many valuable gum-trees, including the gum-arabic, iron-wood, acacias, the boabab-tree, and the deleb-palm. Elephants, giraffes, the two-horned rhinoceros, lions, panthers, apes, and antelopes abound in them, and the hippopotamus and crocodile infest the rivers. Among domestic animals are the camel, horse, ass, ox, buffalo, used as a beast of burden and for riding, sheep with short silky fleece, goat, cat and dog, and pig, the last not found further south than S. The inhabitants of the Isle of Isles are of a very mixed character, but those of the plain are Hassanieh Arabs in the n., Hamites of Beja stock in the e., and the remainder Funj (Fung, Fungheh). The chief occupations of the people are stock-raising, agriculture, and trade, gold, hides, ivory, horses, durra, sesame, gums, and slaves being exported to Egypt and Abyssinia; there is also some manufacturing of cotton-goods, pottery, gold, silver, and iron-work, matting, camel's saddles, and sandals. The towns or villages are on the banks of the Bahr-el-Azrak or Blue Nile. Moslemism is the prevailing religion. S. was formerly an independent negro state, but in 1822 it came under the authority of Ismail Pasha, and has ever since been subject to Egypt.—Pop. about 300,000.

SENARY, a. *sĕn'ėr-ĭ* [L. *senārĭus*, consisting of six each —from *seni*, six each; *sex*, six]: belonging to or containing six.

SENATE, n. *sĕn'āt* [L. *senātus*, council of the elders, the senate—from *senex*, old, aged: F. *sénat*, a senate]: one of the deliberative and legislative assemblies of a state; in *anc. Rome*, the deliberative assembly of the Roman people, possessing supreme legislative powers (see ROME): in the *United States* and in *France*, the upper house of the legislature (see below): in a wider sense, the legislature. There are Senates with various functions in the Hanse towns, Russia, Belgium, Italy, and other countries. The governing body of the Cambridge Univ. (q.v.) is the Senate: the same term, or more specifically SENATUS ACADEMICUS, is used for one of the governing bodies in the Scottish universities (see UNIVERSITY), comprising principal and professors: in the German universities also the ordinary professors, taken collectively, constitute the Academic Senate, and administer their affairs, under governmental superintendence.

The SENATE OF THE UNITED STATES is the upper chamber of the federal legislature. The S. has important functions executive and judicial, in addition to its functions as a legislative chamber. When the S. approves or disapproves the president's appointments to office, also when it approves or disapproves treaties with foreign powers, its function is executive: when it sits for trial of impeachments, it exercises a judicial function. The S. consists (1891) of 88 members—viz., 2 senators from each of the 44 states. No state can be deprived of equal representation in the senate (i.e., 2 senators) without its own consent. The vice-pres. of the United States is president of the S., but has no vote, except a casting vote when the S. is evenly divided. The S. has never adopted any rule of 'closure' or 'previous question' to terminate debate on any question. Executive sessions of the S. are held in secret, and the S. has the power of expelling a senator who betrays the secret of an executive session.—See, for further detail, CONGRESS, UNITED STATES. CONSTITUTION OF THE UNITED STATES (Sec. 3, etc.). SENATOR, n. *sĕn'ă-tėr*, a member of a senate. SEN'ATORSHIP, n. the office or dignity of a senator. SEN'ATO'RIAL, a. *-tō'rĭ-ăl*, pertaining to a senate or senator; in *U. S.*, entitled to elect a senator. SEN'ATO'RIALLY, ad. *-lĭ.* SENATE-HOUSE, n. the place where a senate meets.

SEND, v. *sĕnd* [Icel. *senda;* Dan. *sende;* Sw. *sända;* Goth. *sandjan;* Ger. *senden* to send]: to throw or cast; to impel; to hurl; to thrust; to dispatch; to direct to go and act; to grant, as from a distant place; to cause to be; to inflict. SEND'ING, imp. SENT, pt. and pp. *sĕnt.* SEND'ER, n. *-ĕr*, one who sends. To SEND AWAY, to cause to depart; to dismiss. To SEND FOR, to request by message to come or to be brought. To SEND FORTH, to put or bring forth; to produce; to emit.

SENDAL, n. *sĕn'dăl* [OF. *sendal;* mid. L. *cendalum*, a fine silken stuff—so called because brought from India—from Skr. *Sindhu*, the Indus, Scinde: Sp. *cendal*, a light thin stuff]: a sort of thin silk or thread stuff.

SENECA, *sĕn'ē-ka:* village, cap. of Nemaha co., Kan.; on the s. fork of Nemaha river, and on the Kansas City Wyandotte and Northwestern and the St. Joseph and Grand Island railroads; 77 m. w. of St. Joseph. It is in an agricultural, stock-raising, fruit, and dairy region, and its principal trade is in flour and butter. It has 5 churches, graded schools, co. court-house, 2 national bank (cap. $100,000), 1 priv. bank (cap. $75,000), and 3 weekly newspapers. Pop. (1890) 2,032; (1900) 1,846.

SEN'ECA LAKE: one of a range of narrow lakes in w. N. Y.; 37 m. long from n. to s., and 2 to 4 m. wide; 441 ft. above the Atlantic, 630 ft. deep; and is very rarely frozen over. It is navigated by steamboats from its head to the pretty village of Geneva at its mouth, and discharges by the Seneca and Oswego rivers into Lake Ontario. It takes its name from the Seneca Indians, one of the Six Nations. The much-visited Watkins Glen is near the head of the lake.

SENECA, *sĕn'ē-ka*, LUCIUS ANNÆUS: celebrated philosopher and statesman, and brilliant writer: about B.C. 3—A.D. 65; b. Corduba (Cordova), Spain; second son of Marcus Annæus Seneca, the rhetorician. When a child, he was brought by his father to Rome, where he was initiated in the study of eloquence. He cared more, however, for philosophy, in which his first teacher was the Pythagorean Sotion, whom he afterward left to follow Attalus the Stoic. He travelled in Greece and Egypt; and, in obedience to his father's wishes, he pleaded in courts of law; but notwithstanding his forensic triumphs, he left the bar from fear of Caligula's jealousy. On entering into public life, he filled the office of questor, and had already risen high in the favor of Emperor Claudius, when, being accused of an adulterous connection with Julia, daughter of Germanicus, and wife of Vinicius, he was exiled to Corsica A.D. 41, where he remained eight years, deriving from philosophy and authorship what consolation he could, while incessantly complaining with unphilosophic querulousness, and appealing to the emperor for pardon. When Claudius married his second wife, Agrippina, S. was recalled by her influence, raised to the pretorship, and appointed instructor of her son Nero, then 11 years old. For several years the govt. was practically in the hands of S., and of Burrus, pretorian prefect; and was administered with rare wisdom, energy, and humanity. But Nero, at the death of Burrus, his military tutor, gave way to his depraved passions with a force which S. could not control. All S.'s influence over his pupil was lost, though he profited by his extravagant bounty to such a degree that his accumulated wealth amounted to 300,000 sestertia, or to about $12,000,000. Nero soon began to look with envious eyes on this fortune; and S., to avert dangerous consequences, offered, with much tact, to refund to the emperor his gifts, and begged leave to retire on a small allowance. This Nero declined; and S., under pretense of illness, shut himself up, and refused to appear in public. Nero then attempted to have him poisoned, but failed. A short time afterward, Antonius Natalis, when on his trial for participating in the conspiracy of Piso, implicated S. as one of the conspirators. This mere charge was enough to fix S.'s guilt. He was sentenced to put himself to death. His wife, Paullina, declared her resolution to die with him, and, in spite of his remonstrances, accompanied him into the bath in which, according to his own choice, he was to be bled to death. The emperor, however, would not allow Paullina to die, but removed her from her husband, who gradually expired. —S.'s extant writings are mainly on moral subjects, and consist of Epistles, and of treatises on Anger, Consolation, Providence, Tranquillity of Mind, Philosophical Constancy, Clemency, The Shortness of Life, A Happy Life, Philosophical Retirement, and Benefits. He also speculated on physical phenomena, and wrote seven books entitled *Quæstiones Naturales,* in which he is thought to have anticipated some notions regarded as principles in modern physics. Ten tragedies, ascribed to him by Quintilian, and generally included in editions of his works, have also come down to us; but whether he is their author remains doubtful. They were not intended, certainly not adapted, for the stage. They are overcharged with declamation, and lacking in dramatic life. Of his genuine prose writings, modern opinion takes a divided view; some critics praising his practical sagacity, others finding him destitute of speculative reach. It is perhaps a significant fact that he is admired by French scholars and disparaged by German. His severer critics find his style declamatory, artificial, seeking dazzling effects of form, to the neglect of thought. But his writings have some undeniable excellences. His essays on conduct have been called Stoical sermons; and some students have found in their moral precepts anticipations of Christian ethics. One of the best editions of the prose works is the Bipontine, 1809; of the tragedies, that of Bothe, 1819.

SEN'ECA FALLS: village in Seneca co., N. Y.; on Seneca river, and on the New York Central and Hudson River railroad; 2 m. w. of Cayuga Lake, 10 m. e. of Seneca Lake, 16 m. w. of Auburn, 62 m. e.-by-s. of Rochester. The river falling here 50 ft. affords excellent water-power, which has been developed by numerous manufacturing interests, including flour, woolen, and knitting mills, iron-foundries, and steam fire-engine, agricultural-implement, and pump works. There are 7 churches, 5 public schools, high school, acad., opera-house, 4 hotels, many beautiful residences, 1 national bank (cap. $100,000), 1 savings bank, 1 private bank, and 3 weekly newspapers. Pop. (1880) 5,880; (1890) 6,116; (1900) 6,519.

SENECA-OIL, n. *sĕn'ē-kă-oyl* [so named after the *Seneca* Indians, by whom the oil of Penn. was discovered and used]: name formerly for a kind of petroleum which exudes in small quantities from the rocks, or floats on the surface of springs.

SENECAS, *sĕn'ē-kaz:* tribe of Indians belonging to the confederation known as the Six Nations, and from the early history of the country living in w. N. Y. The name by which they called themselves is said to mean 'People of the Great Hill,' and is thought to have been derived from a tradition that their ancestors rose from the soil on the elevated ground at the head of Canandaigua Lake. Senecas is a corruption of 'Sinnekaas,' the name given to the tribe by the early Dutch settlers of the region. The other nations of the confederacy were located further e. and were less exposed than the S. to attacks by unfriendly tribes. Though they had only 8 of the 50 sachems, the S. supplied the two leading war-chiefs, furnished about one-half of the warriors, and were the most aggressive element of the Six Nations. Their language closely resembles that of the Cayugas, with whom they were long united. The early French explorers found the S. in the region roughly bounded by the lakes Canandaigua, Seneca, Cayuga, and Ontario; but the S. afterward pushed their conquests w. and greatly enlarged their domain. For a long period they were hostile to the French. In 1784 a treaty of peace was made with the U. S. govt. The S. transferred to the govt. a large part of their land in the Genesee valley, and removed to the vicinity of Lake Erie and the Allegheny river. They assisted the govt. in defending the Niagara frontier in the war of 1812. A few years ago they changed their form of govt. from the ordinary rule by chiefs, and adopted a constitution which provides for a council of 16 members, a pres., and a judiciary. Their records are kept in writing. Missions have been established, and many of the people have embraced the Christian faith. They have schools, and speak both the English and their own tongue. Their reservations, in Cattaraugus co. and on the Allegheny river, comprise about 50,000 acres of land, and they receive an annuity from the state and from the national govt. There are many prosperous farmers. The tribe numbered (1900) about 3,000.

SENECIO, *sē-nĕ'shĭ-ō:* genus of plants of nat. order *Compositæ*, sub-order *Corymbiferæ*, having a hairy pappus, a naked receptacle, and a cylindrical involucre of linear equal scales, with a few smaller scales at their base. The species are very numerous; annual, perennial, and half-shrubby plants, natives chiefly of temperate and cold parts of the world, the half-shrubby species being from the warmer latitudes. Some of the species are commonly known as Groundsel (q.v.) and Ragwort (q.v.). *S. Saracenicus* has undivided lanceolate leaves, and was formerly in repute as a vulnerary. The FIREWEED of N. America is *S. hieracifolius.* It receives its popular name from its appearing abundantly in some regions, wherever a part of the forest has been consumed by fire. Many species of S. have a strong disagreeable smell. A few are rather ornamental as flowers.

SENEFFE, or SENEF, *sĕh-nĕf':* town in the province of Hainault, Belgium, about 11 m. n.w. of Charleroi; pop. between 3,000 and 4,000. It is the centre of a district of pottery and glass manufactures. It is notable chiefly for its proximity to the battle-field on which William of Orange (III. of England), at the head of the forces of the coalition against France, was defeated, after a bloody contest, by the Great Condé, 1674, Aug. 11. In William's army there were four lieutenants—Montecuculi (q.v.), Duke Charles of Lorraine, the Prince of Waldeck, and the Prince of Vaudemont, the first three subsequently prominent as military commanders. Of the allied forces of 60,000 men, the Dutch lost 5,000 to 6,000 men, the Spaniards 3,000, and the Imperialists 600; while the French army, which entered into the conflict 30,000 strong, could muster scarcely 20,000 after their victory.—Under the walls of S., Moreau, 1794, defeated the Austrians.

SENEGA, n. *sĕn'ĕ gă*, or SENEKA, n. *sĕn'ĕ-kă*, or SNAKE ROOT [probably so called from the *Seneca* Indians]: dried root of *Polygala Senega* (see POLYGALA). The following are its characters: 'A knobby root-stock, with a branched tap-root of about the thickness of a quill, twisted and keeled; bark yellowish-brown, sweetish, afterward pungent, causing salivation; interior woody, tasteless, inert.' S. is a powerful and trustworthy stimulating expectorant, and may be advantageously prescribed in advanced stages of chronic bronchitis and pneumonia, especially in aged or debilitated patients. It is also a valuable remedy in prolonged hooping-cough, and in latter stages of croup and of bronchitis in young children. The preparations are the Infusion and the Tincture. For children, the powdered root in doses of ten grains is recommended.

SENEGAL, *sĕn-ė-gawl′*, River (called by the natives *Senaga*): large river in w. Africa, rising in Mt. Cooro, lat. 10° 30′ n., long. 10° 40′ w., flowing first n.w., then w. to the Atlantic; length 1,000 m., for the last 740 of which it is in large portions navigable for flat-bottomed boats. Here and there, throughout its course, the navigation is interrupted by cataracts, shoals, and rocks. In the lower course, the river forms numerous large, cultivated, and very fertile islands, and its banks are green and productive, and in part clothed with forests. The entrance is difficult on account of breakers and a bar which, in the dry season, is covered by about 9 ft. of water. It is navigable for some months by steamers drawing not more than 8 ft., to Mediné (furthest inland French station), 650 m. from the mouth (see Senegambia). Thence the French have been making a railway to Bamakon, on the Niger. From Mafu to the sea (215 m.), the river is navigable through the year.

SENEGAMBIA, *sĕn-ė-găm′bĭ-a:* large tract of country—the region watered by the rivers Senegal and Gambia—in w. equatorial Africa, between the Senegal and Sierra Leone. It is bounded by the Atlantic on the w., but has very indefinite eastward limits; estimated about 400,000 sq. m. Between the two great rivers, 250 m. apart, there are no water-courses of importance; and from the Gambia s. to the frontier of Sierra Leone, the only considerable stream is the Rio Grande. The coast is deeply indented by arms of the sea, which resemble estuaries of rivers. The country forms the w. and n. declivity of the plateau of Kong, and part of it is still unexplored. The soil is of two kinds—that of the coasts, and that of the interior: the former consisting in part of low, flat, alluvial plains; and partly of an undulating country, which broadens toward the n., until, on the n. frontier, it merges into the Sahara; while the plateau of the interior rises from the coast plains in mountainous terraces, until it loses itself in the Kong Mts. Its elevations are not accurately determined; Mt. Dara (highest measured) is 4,068 ft. S. is divided into three districts—High, Middle, and Low S. High S. comprises the country n. of the Senegal, and is inhabited by Moors, who, of course, profess Islamism. Middle S. comprises the countries bordering the Senegal, 1,350 sq. m., and is inhabited by negroes, in numerous tribes. The climate is extremely hot, and is unhealthful in the marshy districts. The soil is generally fertile, and yields the crops usual in the hot regions of Africa. Low S. comprises the countries bordering the Gambia, and extends s. to Nunez. France possesses on the left bank of the Senegal (inland to Mediné), and along the coast to the Gambia, about 96,000 sq. m.; pop. about 198,000, the cap. of the French colony of Senegal is St. Louis (q.v.). Portugal has a small tract (30 sq. m.) on andn around the estuary of the Rio Grande; and the English control a little territory at the mouth of the Gambia (26 sq.m.).

SENESCENCE, n. *sĕ-nĕs'sĕns* [L. *senescens*, growing old; *senesco*, I grow old—from *senex*, old]: the state of growing old; decay by time. Senes'cent, a. growing old.

SENESCHAL, n. *sĕn'ĕ-shăl* [OF. *seneschal;* mid. L. *seniscal'cus*, the steward—from Goth. *sins*, old senior?), and *skalks*, servant]: in the *middle ages*, a high steward; officer first in the household of the Frankish kings, who had superintendence of feasts and domestic ceremonies in the houses of princes or high dignitaries. In the course of time the term became one of dignity, applied to military commanders invested also with judicial power; lieutenants of the great feudatories often took the title. A similar officer in England and Scotland was designated steward, rendered in L. *senescallus.* Sen'eschalship, n. the office or dignity.

SENGREEN, n. *sĕn'grēn* [Ger. *singrün*, the house-leek]: a plant, the Common House-leek (q.v.); *Sempervīvum tectōrum*, ord. *Crassulācĕæ.*

SENILE, a. *sē'nīl* [F. *sénile*—from L. *senīlĭs*, aged—from *senex*, old: It. *senile*]: pertaining to old age, or proceeding from it; old; aged. Senility, n. *sĕ-nĭl'ĭ-tĭ*, old age; dotage.

SENIOR, a. *sēn'yėr* [L. *senĭor*, older—from *senex*, old]: older; elder; older in office or rank: N. one older than another; one having superiority or precedence from office or rank; an aged person. Se'nior'ity, n. *-ŏr'ĭ-tĭ*, priority of birth or office. Senior optime, *ŏp'tĭ-mē* [L. *optĭmĕ*, best]: at *Cambridge Univ.*, a second-class man in mathematical honors, the first-class being called wranglers. Senior soph, *sŏf* [Gr. *sophos*, wise]: a third year's man in some European universities.

SENIOR, *sēn'yėr*, Nassau William: political economist: 1790, Sep. 26—1864, June 4; b. Compton, Berks, England; eldest son of the Rev. J. R. Senior, vicar of Durnford, Wilts. He was educated at Eton, and Magdalen College, Oxford, where he graduated 1811, taking a distinguished first-class in classics. In 1819 he was called to the bar at Lincoln's Inn. In 1825 he was elected to the professorship of polit. econ. at Oxford, in which, after its statutory term of five years, he was succeeded by Mr Whately, afterward Abp. of Dublin. S. again held this professorship 1847–52. In 1832 the enormous evils of the poor-law administration in England led to the appointment of a commission of inquiry, of which S. was a member; and the portion of the Report detailing existing abuses was drawn up by him. This Report encouraged the whig govt. to bring in the Poor-law Amendment Act of 1834: see Poor, The—Poor Laws. His publications were very numerous, comprising treatises, lectures, pamphlets, etc., on political economy. He also contributed largely to the *Edinburgh Review* and other leading periodicals. He has left some interesting journals of his visits to Turkey and Greece, and observations on the political and social condition of those countries. His *Essays on Fiction*, contributed to the chief reviews 1821–57, repub. 1864, relate principally to the novels of

Scott, Bulwer-Lytton, and Thackeray. He analyzes the plots and classifies the characters of the Waverley novels with curious felicity, and devotes a masterly essay to Thackeray, whom he regards as the greatest novelist of his day. The intellect of S. was acute, and he is conceded to have done great service to polit. economy by correcting current errors in nomenclature, and by insisting on rigor in reasoning, and strictness in definition. Criticisms have been directed against his too formal treatment, his limitation of scope, and his disregard of the higher and moral elements which have force in political economy. Though honoring the moral forces by a distinct acknowledgment, his system fails to reckon with them. His *Conversations with Distinguished Persons during the Second Empire,* an interesting and valuable work, appeared 1878.

SENLIS, *sŏng-lēs':* very ancient town of France, dept. of Oise, 33 m. n n.e. of Paris. Its older portion is surrounded by walls, flanked with 16 towers, all that remain out of the 28 towers of early times. The cathedral, a small edifice, is a beautiful specimen of early Gothic. S. has many other interesting monuments of antiquity. Manufactures of cloth, lace, and thread are actively carried on. Pop. about 7,000.

SENNA, n. *sĕn'nă* [It. *sena*—from Ar. *sana*, senna: F. *séné*, senna]: leaves of several Eastern plants, much used in medicine as a purgative; *Cassĭa lancĕōlāta, C. acutĭfol'ĭa, C. elongāta, C. obtusāta*, and *C. obovāta*, of genus *Cassia* (q.v.), sub order *Cæsalpinĭēæ*, order *Leguminōsæ.*—Senna is an important purgative, of which two sorts are recognized in the Pharmacopœia —Alexandrian and Tinnevelly. The Alexandrian leaves are obtained chiefly from *Cassia lanceolata*, while the Tinnevelly senna leaves are yielded by *Cassia elongata. Alexandrian S.* is grown chiefly in Nubia and Upper Egypt, and is exported in large bales from Alexandria: it is apt to be adulterated with the flowers, pods, and leaves of *Cynanchum argel* and *Tephrosia apollinea. Tinnevelly* or *E. Indian S.* in odor and taste entirely resembles Alexandrian senna: the leaflets are, however, 'about two inches long, lanceolate, acute, unequally oblique at the base, flexible, entire, green, without any admixture.'

Senna (*Cassia lanceolata*).

Senna as a purgative has been highly commended as certain, manageable, and convenient. In energy, it holds a middle place between the mild laxatives and drastic cathartics. It increases intestinal mucous secretion, as well as peristaltic motion, producing loose brown evacuations. Its disadvantages are its disagreeable taste, and its tendency to produce nausea, griping, and flatulence; the means of correcting which are noticed below. It should never be employed in an inflammatory state of the intestinal mucous membrane. Whatever its cathartic principle may be, it is thought to be absorbed into the circulation before it begins to operate, since this drug imparts a purgative property to the milk of nurses.

The following are the most important preparations, of either Alexandrian or E. Indian S.—1. *Infusion of Senna*, obtained by infusing for one hour, and then straining, half an ounce of S. and half a dram of sliced ginger in half a pint of boiling water. The taste of this infusion is much concealed by addition of black tea, or of coffee, and it may be sweetened with sugar, and milk added; and is then readily taken by children. The addition of neutral laxative salts prevents the griping, while increasing its cathartic action. The ordinary *Black Draught* is commonly prepared by adding one ounce of sulphate of magnesia to four ounces of infusion of senna.—2. *Tincture of Senna*, composed of senna, raisins, caraway seeds, and coriander seeds, macerated in proof-spirit; formerly known as *Elixir Salutis*, or *The Elixir of Health*. This is seldom given alone: it is prescribed most usually in doses of one or two drams, as an adjunct to other cathartic mixtures, to correct their griping properties.—3. *Confection of Senna*, commonly known as *Lenitive Electuary;* a pulpy mixture of powdered senna with powdered coriander seeds, figs, tamarinds, cassia pulp, prunes, extract of licorice, and sugar; all of which substances are, under certain specified conditions, combined by the action of boiling water. When properly prepared, which often it is not, it forms a mild aperient, suited for persons suffering from piles.

The S. leaves are the product of several species of *Cassia* (q.v.), natives of India, Arabia, Syria, and n. Africa. *Cassia obovata* is a perennial herbaceous plant, found in Egypt and Nubia, and now cultivated in Italy, Spain, W. Indies, etc. *C. acutifolia* is a half-shrubby plant, growing in the deserts near Assouan, and the leaves are collected by the Arabs, and carried by merchants to Cairo for sale. *C. elongata* is an annual growing in India. *C. Æthiopica*, about 18 inches high, grows in n. Africa. *C. lanceolata* is an Arabian species.—All these seem to furnish the officinal senna; and they have the leaflets unequal-sided, by which they are readily distinguished from other leaflets often used for adulteration, e.g., *Argel* (q.v.) and *Bladder Senna*. The commercial names seem in general to refer only to the countries or ports from which the leaves are brought.

Bladder Senna (*Colutĕa*) is a genus of shrubs of nat. order *Leguminosæ*, sub-order *Papilionaceæ*, having pinnated leaves, red or yellow flowers, and remarkably inflated pods, whence the Eng. name. One species (*C. arborescens*), native of s. Europe, is almost the only plant found on the ascent of the crater of Mount Vesuvius.

SENNAAR': see Senaar.

SENNACHERIB, *sĕn-năk'ē-rĭb:* Assyrian king: reigned B.C. 705–681; son of Sargon. His invading army met extraordinary disaster, when no fewer than 185,000 Assyrians are said to have been slain by the 'angel of the Lord' (see Hezekiah). The probable explanation is that a sudden and dire pestilence, breaking out in his vast camp, compelled his ending of the campaign. The Egyptian account of this mysterious affair (reported by Herodotus, ii. 141), and that of Berosus the Chaldæan, quoted by Josephus (*Antiq. of Jews,* x. chap. 1), as well as the scriptural narrative, II K. xviii., all evidence at least that S. sustained a sudden and terrible overthrow, which forced him to retreat in hurried confusion to his own country. All that we know of his subsequent history is, that he was assassinated by his sons while worshipping his favorite idol. The discrepancies, both as regards dates and names in the life of S., between the writer of the Book of Kings and profane historians and the Assyrian inscriptions, have been often dwelt upon; but have little importance: the boastful inscriptions of Eastern tyrants cannot usually be trusted for accounts of their failures. S. belongs to that showy class of Eastern monarchs whose rule is commonly described as 'magnificent'—i.e., he built great palaces, and erected monuments in the different parts of his empire, employing the labor of multitudes of captives, and everywhere left an impression of his grandeur. In Scripture, in Herodotus, in Josephus, S. is the 'Great King.' His most imperial work was the palace at Koyunjik, which covered a space of more than eight acres, and was richly adorned with sculpture.

SENNIGHT, or SE'NNIGHT, n. *sĕn'nīt* or *-nĭt* [contracted from *seven-night*]: a week; seven days.

SENNIT, n. *sĕn'nĭt* [from *seven* and *knit*]: a flat plaited cord, formed of rope-yarns; plaited straw or palm-leaves for making hats.

SEÑOR, n. *sān'yōr* [Sp.]: lord; sir; gentleman. SEÑORA n. fem. *sān-yōr'ă,* lady; madam; mistress.

SENS, *sŏng:* old town of France, dept. of Yonne, 70 m. s.e. of Paris; amid pleasing scenery on the right bank of the Yonne. The town proper is surrounded by walls, chiefly of Roman construction, and in the vicinity the remains of ancient roads and of Roman camps abound. S. was the anc. Agenticum, cap. of the Senones, one of the most powerful tribes of Gaul. The spacious and handsome Gothic cathedral is the principal edifice: it was erected 1122–68. An active trade in wines, grain, hemp, wool, and timber is carried on. Pop. (1881) 13,440,(1891) 14,006.

SENSA'TION, in Physiology: may be defined as 'the perception by the mind of a change wrought in the body.' According to this definition, S. involves, first, a bodily change from some cause, inherent or external; secondly, a mental change, whereby the perception of the bodily change is accomplished. The true organ of S. is the brain, especially that portion of it which (according to the eminent physiologist, Dr. Todd) constitutes the centre of S., and extends into the spinal cord, forming the posterior horns of its gray matter: see SPINAL MARROW. Physiologists distinguish between *common* and *special* S. Common S. exists in the skin, and in all parts of the body to which ordinary sensory nerves are distributed, and is excited by ordinary mechanical or chemical stimuli; while special S.

is exemplified in the special senses of vision, hearing, etc. For the due action of the latter, there are organs of special S., which, by the peculiar character of the nerves with which they are supplied, become recipients of impressions of a particular kind—thus, the eye is sensible to light, the ear to sound, etc.; and if the special nerves going to these organs be irritated, instead of pain being excited, as in the case of an ordinary sensory nerve, there is a feeling closely allied to that which would be excited by application of the normal stimulus, as light, sound, etc. Any *ordinary* sensibility those organs (the eye, ear, etc.) possess is dependent on ordinary sensory nerves, and is quite independent of the nerves of special sense.

In works on the physiology of the nervous system, we often meet with the phrases *objective sensation, subjective sensation*, and *reflex sensation*. 'In the ordinary mode of exciting sensations,' says Dr. Todd, 'the presence of an object is necessary. This object creates an impression on the peripheral parts of the sensitive nerves; and the change caused by this impression, being duly propagated to the centre of sensation, is perceived by the mind.' This, the ordinary form of S., is termed an *objective* S., in opposition to a so-called *subjective* S., in which a mental act can develop a sensation independently of any present object. These subjective sensations are excited sometimes by the mind recalling, more or less exactly, the presence of an object; but in many cases they are caused by physical changes in the nerves themselves, due to excess or deficiency of blood, or other pathological causes. Thus, disordered conditions of the retina or optic nerve may give rise to motes or flashes of light; disturbance of the auditory nerve occasions singing in the ears, the sound of distant bells, etc.

To understand the mode in which *reflex* sensations are produced, an acquaintance with *reflex action* (see NERVOUS SYSTEM) is requisite. Illustrations of this form of S. are the facts that the irritation of a calculus in the bladder will give rise to pain in the thighs; that diseased liver often excites pain in the shoulder-joint; and that ice or iced drinks suddenly introduced into the stomach may occasion intense pain in the forehead.—See Todd's article in the *Cyclopædia of Anatomy and Physiology*, or any standard work on Physiology.

SENSA'TION, in the Philosophy of Mind: term denoting a mental process in which is a concurrence of many contrasting phenomena, rendering the word ambiguous, and occasioning verbal disputes.

1. In S. there is a combination or concurrence of physical facts with a mental fact, and the term is apt to be employed in expressing either side. Thus, in sight, the physical processes are known to be—the action of light upon the globe and retina of the eye, a series of nerve-currents in the brain, and a certain outgoing influence to muscles and viscera; these are accompanied by the totally different phenomenon termed the feeling, or the mental consciousness of light. It is to the last fact, the mental fact, that the name S. is most correctly applied; but there is a natural

liability to make it include those physical adjuncts which are inseparable from the mental manifestation.

2. In the still more comprehensive contrast of Mind and the External or Extended World, both members may be designated under S. One and the same situation on our part may contain a strictly mental or *subjective* experience —pleasure or pain, for example—and an *objective* experience, or a recognition of the extended world, as distinct from mind. In looking at a fine prospect, both facts concur in fluctuating proportions: we have a feeling of pleasure (mind or subject) and a knowledge of the outspread or extended world (object), which is what affects us in the same way at all times, and affects all minds alike. As before, S. is most properly used to express the strictly mental or subjective experience, the pleasure or the pain; while the 'Perception' should be applied to express the objective experience: see PERCEPTION.

3. In S. a past experience recovered by memory is inextricably woven with the present impression—a fact which confuses the boundary-line between Sense and Intellect. The S. that the full moon gives rise to is not owing solely to the present effect of the moon's rays on the organs of vision: the present effect revives or restores the total ingrained impression of the moon consequent on all the occasions when we have observed it. Again, it is impossible for us to have a S. without a more or less complex feeling of difference or discrimination, which property is a fundamental fact of intellect. Our S. of the moon supposes a contrast of the white light with the adjoining blue, of the round form with other forms, of the broad disk with a starry point, and so on. Thus, in S. we have a concurrence of all three processes of the intellect—Retentiveness, Agreement, and Difference. S. without Intellect is a mere abstraction; it is never realized in fact.

This last remark has important bearings on the question as to the origin of our knowledge. It has been disputed whether or not our ideas are wholly derived from Sense. Now, inasmuch as there is no such thing as Sense to the exclusion of the Intellect, the question ought to be enlarged and put in this form: Are our ideas wholly derived through Sense in conjunction with the intellectual processes, or are there any ideas that are not or cannot be so derived? When it is alleged, by Cudworth, Price, and others, by way of maintaining the doctrine of Innate Ideas, that Likeness, Unlikeness, Equality, Proportion, etc., are not obtained from Sense, the answer is that their origin may in all probability be accounted for by Sense co-operating with the well-known powers of the Intellect; and that, until the conjunction of the two is proved insufficient, the theory of an Intuitive origin is not called for, in respect to such ideas, while it nevertheless holds good in accounting for the ultimate ideas of Right, Obligation, Beauty, Cause, etc., however the awakening of these may be occasioned by experience.

SENSE, n. *sĕns* [F. *sens*—from L. *sensus*, perception, feeling—from *sentĭō*, I discern by the senses: It. *senso*, sense]: that power or faculty by which animals obtain a knowledge of physical objects, by these either coming into contact with certain organs of the body, or by making impressions on them (see Sensation, in Physiology); perception by the senses; discernment; understanding; strength of natural reason; meaning or import; consciousness. The senses, *sĕn′sĕz* (see below). Sensation, n. *sĕn-sā′shŭn* [F.—L.]: impression on the mind through any one of the senses; state of interest or feeling excited in the mind by external objects, by the passions, by the internal condition of the body, or by the words of a speaker. Sensa′tional, a. *-ăl*, pertaining to sensation; fitted to excite great interest; a term applied to such orators, novelists, or dramatists as seek popularity through the effects on the public mind of startling, exaggerated, or unnatural sentiment or situation. Sensa′tionalism, n. *-ĭzm*, quality or practice of producing popular effect by that which is startling or unnatural: in *philos.*, doctrine that our ideas originate solely in sensation, and consist of sensations transformed (see Sensation, in the Philosophy of Mind). Sensa′tionalist, n. *-ĭst*, one who aims to startle by use of the unnatural or the exaggerated: in *philos.*, one who regards the phenomena of mind as having their origin in sensations. Senseless, a. *sĕns′lĕs*, incapable of sensation; void of feeling; unconscious; stupid; foolish. Sense′lessly, ad. *-lĭ*. Sense′lessness, n. *-nĕs*, the state or quality of being senseless; folly; stupidity. Sensible, a. *sĕn′sĭ-bl* [F.—L.]: capable of being perceived by the senses or by the mind; perceiving by the mind or senses; liable to be easily and strongly affected; moved or affected by a very small weight, impulse, or change; perceiving so clearly as to be convinced; aware; intelligent; judicious. Sen′sibly, ad. *-blĭ*, externally; by impression on the senses; intelligently; judiciously. Sen′sibleness, n. *-bl-nĕs*, or Sen′sibil′ity, n. *-bĭl′ĭ-tĭ* [F. *sensibilité*—from L.]: capacity or readiness of perception or emotion; delicacy of feeling; state of being easily affected or moved (see below). Sen′sitive, a. *-tĭv*, quickly and acutely alive to impressions from external objects; having keen sense or feeling; easily affected or moved; that affects the senses. Sen′sitively, ad. *-lĭ*. Sen′sitiveness, n. *-nĕs*, the state or quality of being sensitive; acute sensibility. Common-sense, the faculty of first principles; native practical intelligence: see Common. Moral sense: see Moral. The inner or internal sense, the capacity of the mind to be aware of its own states; consciousness. In his senses, possessed of reason and judgment; sane. Out of his senses, destitute of the usual powers of reasoning and judging; insane.—Syn. of ‘sense’: sensation; faculty; power; perception; apprehension; sensibility; understanding; reason; opinion; notion; judgment; consciousness; conviction; meaning: import;—of ‘sensation’: perception; sensibility; susceptibility; emotion; passion; consciousness; reflection;—of ‘senseless’: unfeeling; unsympathizing; unreasonable; stupid; doltish; blockish; unconscious.

SEN'SES, The: faculties of the mind connected with certain bodily organs by which animals obtain knowledge of physical objects or facts.

The common reckoning includes the Five Senses—Taste, Smell, Touch, Hearing, Sight; but this is not now considered exhaustive or complete.

For example, the feelings of Hunger, Thirst, Suffocation, Internal Warmth and Chillness, etc., have all the characters implied in an ordinary sensation: they are the result of some External Agent acting on a distinct bodily organ, and giving rise to Feeling, sometimes pleasurable, sometimes painful. In order that these states, related to the sensibility of the different viscera, may find a place among the Senses, they have been grouped under one general head, and designated 'Sensations of Organic Life.' They are of great importance as regards our enjoyments and our sufferings, though not contributing much to our knowledge or intelligence. They approach nearest to Taste and Smell, the emotional senses, and are at the furthest remove from the intellectual senses—Touch, Hearing, and Sight.

Again, the feelings connected with our Activity, or with the exercise of the muscular organs—as the pleasures of exercise and rest, the pains of fatigue, the sensibility to weight, resistance, etc.—were, until lately, overlooked in the philosophy of the mind. When they began to be recognized, it was common to treat them as a sixth sense, called the Muscular Sense. But this does not represent their true position. They do not arise from external agents operating on a sensitive part, but from internal impulses proceeding outward to stimulate the muscular energies, and to bring about movements; they are thus the contrast of the Senses as they have been ordinarily defined. Sense is associated with the *ingoing* nerve-currents, Movement with the *outgoing*. The contrast has seemed so great and fundamental, that the Feelings of Movement and Muscular Strain have by some been classed as a genus distinct from the genus Sense, and not as a species of that genus. The classification of the fundamental sensibilities of the mind would then stand thus: I. Feelings of Muscular Energy. II. Sensations of the Senses—1. Organic Life; 2. Taste; 3. Smell—Emotional; 4. Touch; 5. Hearing; 6. Sight—Intellectual.—Yet it is suggested that the contrast above noted may not be so fundamental as it seems; and that, at least provisionally, a definition of the Senses may be adopted (see beginning of this article) which will admit both classes of sensations.

SENSIBIL'ITY, in Physiology: in a properly limited sense, the power possessed by any part of the body to cause the mind to perceive changes wrought in such bodily part, whether those changes be inherent or excited from without: the greater this power, the greater the S. of that bodily part. The term S. has been vaguely used by physiologists. It has often been confounded with Irritability, though Haller, more than a century ago, clearly laid down the distinction between these two properties of tissues. It is frequently applied to nerves, to signify their power of envolving nervous force; but Excitability (as Dr. Todd observes) more exactly implies what is meant in this case. The degree of S. of different parts of the outer surface of body is very various. The relative S. has been ascertained by Weber by touching the surface with the points of a pair of compasses tipped with cork, and then (the subject's eyes being closed) by approximating the points until they were brought within the smallest distance at which they could be felt to be separate. The following are a few of his results: point of tongue, ½ a line; tips of fingers, 1 line; red surface of lips, 2 lines; palmar surface of 2d phalanx, 2 lines; palmar surface of metacarpus 3 lines; tip of the nose, 3 lines; palm of the hand, 5 lines; dorsum of the hand, 8 lines; vertex, 15 lines; skin over the spine and the middle of the thigh, each 30 lines: so that the S. of the skin is at least 60 times greater in some parts than in others.

SENSISM, n. *sĕns'ĭzm:* the same as SENSATIONALISM.

SEN'SITIVE PLANT: name commonly given to certain species of *Mimosa* (see MIMOSEÆ), on account of the peculiar phenomena of Irritability (q.v.) which their leaves exhibit in their collapse when touched or shaken. Numerous species of *Mimosa* possess this property, and, indeed, most of the species in a greater or less degree; but those in which it is most conspicuous are humble herbaceous or half-shrubby plants. They have leaves beautifully divided, again and again pinnate, with a great number of small leaflets, of which the pairs close upward when touched. On repeated or rougher touching, the leaflets of the neighboring *pinnæ* also close together, and all the pinnæ sink down, and at last the leaf-stalk itself sinks down, and the whole leaf hangs as if withered. If the stem is shaken, all the leaves exhibit the same phenomena. After a short time, the leaf-stalk rises, and the leaflets expand again. On account of this curious and interesting

Sensitive Plant (*Mimosa pudica*).

property, some of the sensitive plants are frequently cultivated in hot-houses. They are generally treated as annuals, though capable of longer life. *M. sensitiva*, one of the best-known species, is a native of Brazil, with prickly stems and leaf-stalks, and small heads of rose-colored flowers. *M. pudica* has a herbaceous stem, bristly, but not prickly. *M. casta*, *M. pudibunda*, *M. palpitans*, and *M. viva*, also are among the most sensitive species.

SENSITIZER, n. *sĕns'ĭ-tīz-ėr:* in *photog.*, any substance added to a photographic material to increase or alter its sensitiveness to light. SENSITOM'ETER, n. *-tŏm'ĕ-tėr*, in *photog.*, apparatus for testing the sensitiveness of photographic preparations.

SENSORIUM, n. *sĕn-sō'rĭ-ŭm* [L. *sensus*, perception—from *sentĭō*, I discern by the senses]: a part, not definitely known, of the nervous system, to which are assigned the central functions of sensation and of consciousness as far as pertains to their manifestation; the supposed organ, usually assigned to the brain, which receives impressions made on the senses. SENSORIAL, a. *sĕn-sō'rĭ-ăl*, of or pert. to the sensorium. SENSORY, a. *sĕn'sō-rĭ*, connected with the sensory or sensation; having direct connection with the nerves of sensation: N. same as SENSORIUM.—*Sensorium* is a collective term applied by physiologists to a series of ganglionic centres, to each of which is attributed the power of communicating to the mind the impressions derived from the organ with which respectively it is connected, and of exciting automatic or involuntary muscular movements in respondence to these sensations. (See Carpenter *On the Functions of the Nervous System in Human Physiology*, 6th ed., 545.) These ganglionic centres, which lie at the base of the brain in man, are in direct connection with the nerves of sensation, and appear to differ entirely in their functions from the other parts of the encephalon. Anterior, there are the *olfactive* ganglia, or what are termed the bulbs of the olfactive nerves. The ganglionic nature of these structures is more evident in many of the lower mammals, in whom the organ of smell is highly developed, than it is in man; though even in the human subject these masses contain gray or vesicular nervous matter, indicating their true ganglionic nature. Behind these are the *optic* ganglia, commonly known as the corpora quadrigemina, small in man, but comparatively large in many of the lower mammals. The *auditory* ganglia do not form distinct projecting masses, but are represented by small masses of vesicular matter, into which the auditory nerves may be traced, and which are imbedded in the medulla oblongata. In fishes there is a well-developed and distinct auditory ganglion. The *gustatory* ganglion is the least distinct of any, but it is supposed to be represented by a mass of vesicular matter imbedded, like the preceding ganglion, in the medulla oblongata, and into which the nerves of taste may be traced. On examining a progressive series of brains from man to the lowest mammals, we find a continuous diminution of the hemispheres, and a corresponding development of these ganglia, at least of the olfactory and optic ganglia; while, if we continue the investigation to the brains of birds, reptiles, and fishes, we find the same law in force, till finally, in reptiles and fishes, those ganglia form the greatest part of the brain.

It was long attempted to determine some one point in the brain where the soul is especially located or centralized; and to this conjectured point the name Sensorium was applied in the older psychological speculations: the fancy of Descartes made it a small body near the base of the brain, called the 'pineal gland.' The recent theories of the nervous system repudiate the idea of a central point of this nature; in consciousness, the brain generally is active, though, under different impressions and ideas, the currents may be presumed to follow different nerve-tracks. Consequently no meaning is now attached to a S. in psychology, as distinct from the cerebrum at large.—In biology, S. denotes the entire physical apparatus for receiving and transmitting sensations, including, with the organs of special senses, the nervous system, skin, etc.

SENSUAL, a. *sĕn'shû-ăl* [F. *sensuel*, sensual—from mid. L. *sensuālĭs*, endowed with feeling—from L. *sensus*, perception, feeling; *sentĭō*, I feel]: pertaining to or affecting the senses only; not intellectual; carnal; not spiritual; given to the indulgence of the appetites; devoted to the pleasures of sense; luxurious; lewd; voluptuous. SEN'SUALIZE, v. *-īz*, to make sensual; to debase by the indulgence of the appetites. SEN'SUALIZING, imp. SEN'SUALIZED, pp. *-īzd.* SEN'SUALIZA'TION, n. *-ĭ-zā'shŭn*, the act of sensualizing, or the state of being sensualized. SEN'SUALISM, n. *-ĭzm*, a state of subjection to sensual feelings or appetites; in *mental philos.*, the theory held by many that all our ideas, our mental acts, and our intellectual powers, are but mere modifications of former sensations, or originated in them; sensationalism; opposed to *intellectualism*. SEN'SUALIST, n. *-ĭst*, one addicted to sensual pleasures; a voluptuary; one who holds the theory of sensualism. SEN'SUALLY, ad. *-lĭ.* SEN'SUALNESS, n. *-nĕs*, or SEN'SUAL'ITY, n. *-ăl'ĭ-tĭ* [F. *sensualité*—from mid. L. *sensualĭtātem*]: the state or quality of being sensual; devotedness to the gratification of the bodily appetites. SEN'SUOUS, a. *-ŭs*, pertaining to or addressed to the senses; connected with sensible objects; full of passion; pathetic.—SYN. of 'sensualist': epicure; gourmand; voluptuary.

SENT: pp. of SEND, which see.

SENTENCE, n. *sĕn'tĕns* [F. *sentence*—from L. *senten'tĭa*, an opinion, a decision, a sentence—from *sentĭō*, I perceive or feel: It. *sentenzia*]: the judgment pronounced on a criminal by a judge; decree or judgment of a court; a maxim; an opinion; a decision, usually unfavorable. series of words so arranged as to convey complete sense, and followed by a dot or full point, thus (.) (see below): in *OE.*, sense; meaning: V. to pass judgment on, as a court; to doom; to condemn. SEN'TENCING, imp. SEN'TENCED, pp. *-tĕnst.* SENTENTIAL, a. *sĕn-tĕn'shăl*, pertaining to a sentence or period; comprising sentences. SENTEN'TIALLY, ad. *-shăl-lĭ.* SENTEN'TIOUS, a. *-shŭs* [L. *sententĭōsus*, full of meaning]: abounding in axioms or maxims; short and pithy in expression; terse; comprising sentences. SENTEN'TIOUSLY, ad. *-lĭ*. SENTEN'TIOUSNESS, n. *-nĕs*, brevity and pithiness in expression. A DARK SENTENCE, a saying not easily understood.—SYN. of 'sentence, n.': phrase; expression; proposition; periŏd; paragraph; opinion; dogma; condemnation; doom.

SEN'TENCE: the form of words in which a thought or a Proposition (q.v.) is expressed. A mere phrase or group of words, e.g., 'A very high mountain,' which only conveys a meaning or calls up an idea, but does not make an affirmation, is not a S. Since speech is the expression of thought, the S. is the proper unit or integer of speech, and thus forms the starting-point in the study of language.

Every single S. is made up of two parts—one naming the subject or the something that is spoken about; the other the predicate or the something that is said of it—as, 'The sun—shines;' 'Those who have the greatest gifts, and are of the greatest usefulness—are the most humble.' Every S. must contain a finite verb, as it is the function of the Verb (q.v.) to make affirmations. 'The sun shines,' is an example of a S. in its barest form, containing merely the subject 'sun' and the predicate 'shines,' which are called the *principal* elements. The enlargement or development of the S. takes place by means of adjuncts, or *secondary* elements, tacked on to the principal elements—as, '*Young* birds build *nests without experience*.'—Sentences may be classed as simple, compound, and complex.

1. A simple S. has only one subject and one finite verb. Reduced to its essentials, it is of the form, 'The sun shines;' 'The day is cold.' 2. A compound S. consists of two or more simple sentences combined—e.g., 'The sun gives light by day, and the moon by night;' which contains two affirmations or sentences, 'The sun gives light by day,' and 'The moon gives light by night.' 3. A complex S. consists of one principal S. with one or more dependent sentences. In the compound S. given above, there are two distinct statements; and as both are put on the same footing, they are said to be *co-ordinate* sentences. But when we say, 'The moon rose as the sun went down,' the going down of the sun is not mentioned on its own account; the only thing directly affirmed is that the moon rose at a certain time, and the going down of the sun is introduced only as marking that time. Such clauses are called *subordinate* sentences (see CONJUNCTIONS). The subordinate clauses of complex sentences may be considered as transformations of the elements of the simple S.; and according to the nature of the element which has been transformed, they might be called noun-sentences, adjective-sentences, or adverbial sentences—e.g., '*The existence of God* is a ground of comfort'='*That God exists* is a ground of comfort.' '*Benevolent* men are happy'='Men *who seek the good of others* are happy.' 'The moon rose *at sunset*'='The moon rose *as the sun went down*.' Further, the nouns, adjectives, and adverbs that enter into a subordinate S. may, one and all, be transformed in their turn

into sentences, which will thus be subordinate in a still higher degree—e.g., 'Europe rejoiced *that Greece was delivered from that oppressive power*'='Europe rejoiced *that Greece was delivered from the power that had oppressed her.*' Here the adjective *oppressive* in the first S. has in the second been converted into a S. directly dependent, not on the principal S. (Europe rejoiced), but on the subordinate; and is therefore subordinate in the second degree. Subordination is seldom carried beyond the second or third degree, as it becomes perplexing, and weakens the force of the principal assertion. The same S. is often compound, as containing two or more co-ordinate sentences; and at the same time complex, as containing one or more subordinate sentences in addition; and to discriminate all these, and point out their relations, is to give the syntactical analysis of the sentence.

SENTER, *sĕn'tĕr*, Isaac, M.D.: 1755–99, Dec. 20; b. N.H. After studying medicine, he became a surgeon in the revolutionary army, was with the expedition to Quebec under Arnold, practiced medicine at Pawtucket, R. I., but afterward removed to Newport, where he became famous as a physician and surgeon. He wrote for medical journals and was an honorary member of various medical societies, including those of London and Edinburgh.

SENTERY, n. *sĕn'tĕr-ĭ*, and Sen'teries, plu. *-tĕr-ĭz:* OE. for Sentry and Sentries.

SENTIENT, a. *sĕn'shĭ-ĕnt* [L. *sentiens* or *sentĭen'tem*, discerning or perceiving by the senses—from *sentīrĕ*, to feel]: that perceives or feels; having the faculty of perception: N. one who has perception. Sen'tiently, ad. *-lĭ.*

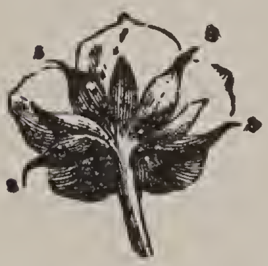
SENTIMENT, n. *sĕn'tĭ-mĕnt* [F. *sentiment*, understanding, sentiment—from L. *sentĭō*, I perceive or feel: It. *sentimento*]: opinion; the decision of the mind expressed in words; thought, or direction of thought; a sentence or passage, as the expression of a thought; a particular disposition of mind; an opinion expressed in striking words; tender susceptibility; feeling; sensibility; emotion. Sen'timent'al, a. *-ăl*, abounding with or exciting sensibility; appealing to sentiment, rather than reason; artificially or affectedly tender; indulging in displays of exaggerated feeling; romantic. Sen'timent'ally, ad. *-lĭ.* Sen'timental'ity, n. *-ăl'ĭ-tĭ*, affectation of sentiment or fine feeling. Sen'timent'alize, v. *-ăl-īz*, to affect refined thought and express it in suitable language. Sen'timent'alizing, imp. Sen'timent'alized, pp. *-īzd.* Sen'timent'alism, n. *-ăl-ĭzm*, the character or behavior of a sentimentalist. Sen'timent'alist, n. *-ăl-ĭst*, one who affects fine feeling or exquisite sensibility.—Syn. of 'sentiment': opinion; notion; thought; feeling; disposition; judgment; maxim; saying; toast; sensibility.

SENTINEL, n. *sĕn'tĭ-nĕl* [F. *sentinelle;* It. *sentinella*, a sentinel: OF. *sente*—from L. *sēmĭta*, a path: also derived by some from L. *sentiō*, I perceive]: one who watches or keeps guard; a sentry: V. to watch over; to furnish with a guard. SEN'TINELLED, a. *-nĕld*, furnished with sentinels.—*Sentinel* or sentry is a private soldier, marine, or sailor, posted at a point of trust, with the duty of watching the approach of an enemy, or of any person suspected. Sentries mount guard over depots of arms, the tents of commanding officers, etc. During the night, each sentry is intrusted with the 'word,' or countersign; and no person, however exalted in position, may attempt to approach or pass him without giving that word as a signal. In such case, the sentry is bound to arrest the intruder, and, if necessary, to shoot him. It has happened that the commander-in-chief of an army—not remembering the word, or refusing to give it—has been prisoner in the hands of one of his own sentries. When an army is in the field, the sentries are its eyes, for they guard the approaches in every direction, some distance in front of the main body of troops. In the event of attack, they give the alarm, and retire slowly to their supports. There is usually an agreement, tacit or expressed, between hostile commanders that their outlying sentries shall not fire on one another, which would only produce useless bloodshed. Under martial law, death is the penalty to a sentry for sleeping on guard.

SENTRY, n. *sĕn'trĭ* [F. *sentier;* OF. *sente*, a path, the sentry being confined to a short path or beat (see also SENTINEL)]: soldier placed on guard to give notice of the approach of danger; guard; watch; the duty of one on guard. SENTRY-BOX, a stout portable shed for the occasional shelter of a soldier on guard.

SENZA SORDINO, *sen'tsâ sawr-dē'nō* [It., without the mute, or without the damper]: musical term, which, when applied to the violin or violoncello, denotes that the Mute (q.v.) is to be removed. In pianoforte music, it means that the performer must press down the pedal which takes off the dampers.

SEOUL, *sē-ōōl*, or HAN-YANG, city, capital of Corea. In the native language S. means, literally, 'capital,' and HAN-YANG, 'the fort on the Han.' S. is on the Han river, and under commercial treaties is open to foreign trade which is carried chiefly in Japanese ships. S. has an English school, with 2 professors and 130 students, an American mission school, and 10 Japanese schools, all of which are subsidized by the govt.. By the American and English missions several hospitals have been established where male and female physicians attend. The streets of S. are narrow, and the city, which lies in a valley, is surrounded by a dilapidated wall with several imposing gates. During the Japan-Chinese war (1894–5) S. was occupied by Japanese troops, and the Corean peninsula was for a time the seat of war.—See COREA.—Pop. of S. according to the native (census taken in 1902, June) was 196,646, of whom about 50,000 were in the suburbs.



s, *s*, Sepals.

SEPAL, n. *sē'păl* [a term invented, by changing the *pet* of Gr. *petalon*, a leaf, into *sep*—thus, *sepalon :* F. *sépale*] : in *bot.*, one of the leaf-like divisions of the cup or Calyx (q.v.), which incloses the corolla or blossom of a flower. SE'PALLED, a. *-păld*, having sepals. SEPALOID, a. *sĕp'ăl-oyd* [Gr. *eidos*, appearance] : like or having the appearance of a sepal. SEPALODY, n. *sĕp-ăl'ō-dĭ*, the conversion of petals, or other parts of the flower, into sepals. SEP'ALOUS, a. *-ŭs*, resembling a sepal.

SEPARABLE : see under **SEPARATE.**

SEPARATE, v. *sĕp′ă-rāt* [L. *separātus*, disjoined, separated; *separārĕ*, to separate—from *se*, aside; *parārĕ*, to arrange: It. *separare:* F. *séparer*]: to part or disunite; to break or divide into parts; to sever from the rest; to withdraw, as persons from a meeting, etc.; to withdraw from each other; to make a space between; to set apart for a particular purpose; to open: Adj. divided from the rest; alone; disunited; detached; distinct. Sep′arating, imp. Sep′arated, pp. Sep′arator, n. *-rā-tėr*, one who or that which separates. Sep′arately, ad. *-lĭ*, apart; singly; not in union; distinctly. Sep′arateness, n. *-nĕs*, the state of being separate. Sep′ara′tion, n. *-rā′shŭn* [F.—L.]: act of separating; disjunction; disconnection: legal disunion of married persons (see below). Sep′arative, a. *-rā-tĭv*, causing or promoting separation. Sep′arable, a. *-ă-bl* [F.—L.]: that may be disjoined; divisible. Sep′arably, ad. *-blĭ*. Sep′arableness, n. *-bl nĕs*, the quality of being separable or capable of separation. Sep′arabil′ity, n. *-bĭl′ĭ-tĭ*, the quality of admitting disunion. Sep′aratist, n. *-tĭst*, one who withdraws himself from communion with an established church, or from a church to which he has belonged; a dissenter (see Dissenters: Quakers: also Oath: and for the application of the term in the early part of the 17th c. in England, see Pilgrim Fathers). Sep′aratism, n. *-tĭzm*, separation from a religious body; dissent. Sep′aratory, n. *-tėr-ĭ*, in *chem.*, a vessel for separating liquids; a surgical instrument: Adj. used in separation; separative.—Syn. of 'separate, v.': to detach; disconnect; disjoin; divide; part; sever; sunder; disunite.

SEPARATE ESTATE: property belonging exclusively to one of several persons who with respect to other property are joint-owners—e.g., the S. E. of a partner—property belonging to him as an individual: in particular, S. E. of a married woman is the property belonging to her exempt from control by the husband. The tendency of legislation throughout the United States has been toward entirely doing away the husband's common-law marital right of control of the wife's property, and giving to the wife the same right of control of her property as if she were unmarried.

SEPARATE LUTH′ERANS: pietist sect, with various doctrines and branches, which originated at Würtemberg. Opposed for their extreme views, they became separated from the Lutheran body. The name separatist, besides its use in other countries, has been applied to a small society in Bremen, followers of a Lutheran student of theology, Theodore Schermer, who in 1699 advocated the doctrine of an intermediate state of punishment, rejected infant baptism, and discountenanced public worship and the Lord's Supper as liable to abuse. They led a quiet and devout life.—The Separate Lutherans proper do not differ in essential points of faith and practice from Lutherans in general, but only in the pietism, or some excrescence, that has led to their distinct organization. A portion emigrated to America in 1803, and soon were organized by George Rapp, a seceder from the Lutherans at Würtem berg; they hold and practice a community of goods, and still exist as a sect in Pennsylvania, occupying the town of Economy in Beaver county, 17 m. below Pittsburgh, on the Ohio. They assumed the name Harmony Society. They are reported, 1891, to have decreased from hundreds, originally, to about 40 persons, and the communal wealth, invested largely in stocks and bonds, is said to be nearly $40,000,000. Those who, early in the 19th c., remained in Germany became known as Kornthalites, from the place, Kornthaler, near Stuttgart, where a community was founded 1819 by G. W. Hoffman. They were extreme millenarians, and purposed to emigrate to Palestine, there to set up anew, in original purity, the kingdom of Christ. A part remained in their native valley as a kind of Moravian community; and a portion, under leadership of Hoffman the younger, at Kirchenhardthof, revived in 1854 the purpose to emigrate to the Holy Land. They are known as Hoffmanites, or Jerusalem Friends, also as the German Temple; they numbered about 3,000, and have founded two colonies, one at Jaffa, in Syria, under Hoffman, who took the title of bishop.

SEPARA'TION of Married Persons: legal disunion of husband and wife—either judicial or voluntary. If the parties enter into a deed, or other arrangement, to live separate, this is called voluntary S.; and, in general, the legal rights of the parties are not altered, except that if the wife is provided with maintenance, she has no longer an implied authority to bind the husband. And though voluntary S. is not encouraged by courts of law, yet effect will be given frequently to deliberate contracts of this kind entered into between the parties. See JUDICIAL SEPARATION.

SEPAWN, n. *sĕ-pawn'*, or SEPON, n. *sĕ-pŏn'*: porridge made from maize meal, used as food in N. America.

SEPIA, n. *sē'pĭ-a*, SEP'IÆ, n. plu. *-ĭ-ē* [L. and Gr. *sēpĭa*, the cuttle-fish: It. *seppia*]: the Cuttle-fish (q.v.): in the *fine arts*, a fine brown coloring matter, prepared from the black secretion or ink of the cuttle-fish (see below). SEP'IC, a. *-ĭk*, pertaining to sepia; done in sepia, as a drawing. SEPIADÆ, n. plu. *sĕ-pī'ă-dē*, a family of Cuttle-fish (q.v.). SEPIOLITE, n. *sĕp'ĭ-ō-līt* [Gr. *lithos*, a stone]: a mineralogical name for meerschaum. SEPIUM, n. *sē'pĭ-ŭm*, internal bone of a cuttle-fish.

SEPIA, *sē'pĭ-a:* pigment used as a water-color. It is prepared from the secretion of a peculiar organ, called the ink-bag, found in the dibranchiate *Cephalopoda*, or Cuttle-fishes. This secretion is black at first, and insoluble in water, but extremely diffusible through it; it is therefore agitated in water to wash it, and then allowed slowly to subside, after which the water is poured off, and the sediment, when dry enough, is formed into cakes or sticks. In this state it is called 'India Ink.' If, however, it is dissolved in a solution of caustic potash, it becomes brown, and is then boiled and filtered, after which the alkali is neutralized with an acid, and the brown pigment is precipitated and dried: this constitutes the proper sepia. It is usually prepared in Italy, great numbers of the species which yields it most abundantly, *Sepia officinalis,* being found in the Mediterranean. The black kind, called India Ink, is prepared in China, Japan, and India, and forms the common writing-ink of those countries.

SEPIMENT, n. *sĕp'ĭ-mĕnt* [L. *sepimen'tum*, a hedge—from *sepĭō*, I hedge in; *sepes,* a hedge]: a hedge; a fence; a partition.

SEPIOSTARE, n. *sĕp'ĭ-ŏ-stär'*, or SEPIOSTARIUM, n. *sĕp'ĭ-ŏ-stā'rĭ-ŭm* [Gr. *sēpĭa*, the cuttle-fish; *ŏstĕon*, a bone]: internal shell of the sepia, usually called the cuttle-bone.

SEPOMETER, n. *sē-pŏm'ĕ-tėr* [Gr. *sēpō*, I putrefy; *metron*, a measure]: instrument for determining, by means of the decoloration and decomposition produced in permanganate of soda, the amount of organic impurity existing in the atmosphere.

SEPON: see SEPAWN.

SEPOY, n. *sē'poy* [corrupted from Pers. *sipáhí*, a soldier; *sipáh*, an army—from *sip*, bow and arrow]: native of India, employed as a soldier by the Brit. govt. for service in their Indian empire (see EAST INDIA ARMY). The present S. force is stated at about 140,000.

SEPS, n. *sĕps* [Gr. *sēps*, a venomous serpent whose bite causes putrefaction—from Gr. *sēpō*, I make rotten]: a genus of snake-like lizards having four very short legs, found in the E. Ind. and in the s. and n. of Africa: see SKINK.

SEPT, n. *sĕpt* [a corruption of SECT, which see]: a clan, a branch of a race, or a family—chiefly used of the Irish clans.

SEPT, n. *sĕpt* [L. *septum,* an inclosure]: in *arch.*, a railing.

SEPT, *sĕpt* [L. *septem*, seven]: prefix, signifying seven.

SEPTA: see SEPTUM.

SEPTANGULAR, a. *sĕpt-ăng'gū-lėr* [L. *septem*, seven; *angŭlus*, a corner]: having seven angles.

SEPTARIUM, n. *sĕp-tā'rĭ-ŭm*, SEPTA'RIA, n. plu. *-rĭ-ă* [L. *septum*. a fence or division; *sepĭō*, I hedge—from *sepes*, a hedge]: ovate flattened nodules of argillaceous limestone, internally divided into numerous angular fragments by reticulating fissures radiating from the centre to the circumference, which are filled with some mineral substance, e.g., carbonate of lime or sulphate of barytes, that has been infiltrated subsequent to their formation. The fissures have been produced by the cracking of the nodule when drying. They are largest and most numerous in the centre, and gradually decrease outward, showing that the external crust had first become indurated, and so, preventing any alteration in the size of the whole mass, produced wider rents as the interior contracted. The radiating figure, and the striking contrast between the dark body of argillaceous limestone and the more or less transparent sparry veins, when the nodule is cut and polished, have caused them to be manufactured into small tables and similar objects; but they are used most in manufacture of Roman cement, which hardens under water, and which is named from a famous hydraulic cement made of ferruginous volcanic ash brought from Rome. Septaria occur in layers in clay deposits, and are quarried there. They are also dredged up off some coasts, from whose cliffs they have been washed out by the waves. The nodules generally contain a scale, shell, plant, fruit, coprolite, or other organic substance, forming the nucleus that has apparently excited the metamorphic action which withdrew from the surrounding clay the calcareous and ferruginous materials scattered through it, and aggregated them around itself. From the general shape of many septaria, and the wearing away of the outer shell, revealing the turtle-like markings of the fissures, septaria are sometimes mistaken for fossil turtles.

SEPTATE, a. *sĕp'tāt* [L. *septum*, a fence or division]: in *bot.*, separated or divided by partitions.

SEPTEMBER, n. *sĕp-tĕm'bėr* [L. *September*, pertaining to the seventh month of the old Roman year—from *septem*, seven: F. *Septembre*]: ninth month of the year, formerly the seventh when the year began with March. It has always contained 30 days. SEPTEM'BRIST, n. *-brĭst*, in *F. hist.* (see SEPTEMBRISTS); thence a bloodthirsty person.

SEPTEMBRISTS, *sĕp-tĕm'brĭsts*, or SEPTEMBRISERS, *sĕp·tĕm-brī'zėrz* (Fr. *Septembriseurs*): frantic executioners in the 'September massacres' in Paris, 1792, Sep. 2, 3. The particular causes of this ferocious outburst were twofold—panic fear of domestic traitors and of foreign despots. The news came pouring into Paris, ever more and more maddening, of Prussian and Austrian hordes marching victorious over the frontiers; insolent royalists obtruding themselves in the van of the invading armies, and breathing threatenings and slaughter; while numerous *aristocrates* (i.e., favorers of the king and court) were believed to be making preparations to receive them in Paris. At the same moment broke out the royalist insurrection in *La Vendée*, rendering France still further delirious; whereupon Danton, 'minister of justice,' procured the passing of a decree 1792, Aug. 28, ordering domiciliary visits for arrest of all suspected persons, and for seizure of arms of which patriotic France stood much in need. More than 2,000 stand of arms were got in this way, and 400 new prisoners. On the morning of Sep 2 arrived the news of the capture of Verdun by the Prussians. The mingled rage and fear of the people cannot be described. All the bells in Paris were set clanging; men and women hurried in myriads to the *Champ de Mars* to be enrolled as volunteers. Danton entered the legislature—'the black brows clouded, the colossus-figure tramping heavy, grim energy looking from all features of the rugged man'—and made that famous speech ending: 'Pour les vaincre, pour les atterrer, que faut-il? De l'audace, encore de l'audace, et toujours de l'audace.' The effect was electrical. He obtained from the assembly a decree condemning to death all 'who refused to march to the frontiers or to take up arms.' But patriotism against foreigners was not enough. Were not the traitors at home deserving of death? Marat thought so: multitudes of frantic men and women shared his conviction; but it is not proved that either Marat or Danton formally ordered the massacres, or, indeed, that anybody ordered them. They were rather the spontaneous outburst of patriotic insanity, imagining aristocratic treachery and plots everywhere. Priests, Swiss soldiers, aged and infirm paupers, women both reputable and disreputable, and criminals, were mercilessly cut down or shot. From Sunday afternoon till Thursday evening the wild butchery went on at the Bicêtre, the Abbaye, the Convent of the Carmelites, the Conciergerie du Palais, the Grand Châtelet, St. Firmin, La Force, and the Salpétrière. One gathers a glimpse of the savage sincerity of the Septembriseurs when one reads that the gold rings, watches, money, etc., found on the persons of the massacred were all religiously brought to the town-hall; not a single thing was stolen or furtively appropriated until after the essential massacre was done. Then the scoundrels ('sons of darkness,' as Carlyle calls them) sallied out into the streets, and began to plunder, but were speedily suppressed and forced back into their dens.

Great misapprehension prevails as to the numbers who perished in these fearful scenes. Royalist pamphleteers and others, trusting mainly to fantasy (according to Carlyle, *Fr. Rev.*, II. 158), reckon the victims at 3,000, 6,000, even 12,000; but the accurate advocate Maton (who was in the thick of the horrors, and narrowly escaped the guillotine) reduces the number, by 'arithmetical ciphers and lists,' to 1,089, which, be it observed, included numbers of forgers of assignats, and other criminals. It was a sad and horrible affair, as all massacres are; but it is desirable not to exaggerate its *dimensions*, and it is best to trace as correctly as possible the motives of the actors in so execrable a tragedy.

SEPTEMFID, a. *sĕp'tĕm-fĭd* [L. *septem*, seven; *fidi*, I cleft—from *findo*, I cleave]: in *bot.*, applied to a leaf having seven divisions, extending about half-way through it.

SEPTEMPARTITE, a. *sĕp'tĕm-pâr'tīt* [L. *septem*, seven; *partītus*, divided—from *pars* or *partem*, a part]: in *bot.*, having seven divisions in a leaf with radiating venation, which may extend to near the base.

SEPTENARY, a. *sĕp'tĕn-ér-ĭ* [L. *septenārĭus*, consisting of seven—from *septēnī*, by sevens; *septem*, seven: F. *septénaire*]: consisting of seven; happening once in seven years; lasting seven years: N. the number seven.

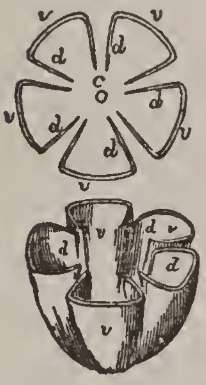
SEPTENATE, a. *sĕp'tĕn-āt* [L. *septēnī*, seven each—from *septem*, seven]: in *bot.*, having parts in sevens—as a compound leaf with seven leaflets coming from one point.

SEPTENNIAL, a. *sĕp-tĕn'nĭ-ăl* [L. *septem*, seven; *annus*, a year]: lasting or continuing for seven years; returning once every seven years. Septen'nially, ad. *-lĭ*.

SEPTENTRION, n. *sĕp-tĕn'trĭ-ŏn* [F. *septentrion* —from L. *septen'trĭōnes*, the north—from *septem*, seven; *trĭōnes*, the plowing oxen—seven stars near the north pole]: in *OE.*, the north: ADJ. northern. SEPTEN'TRIONAL, a. *-ŏn-ăl*, in *OE.* northern.

SEPTIC, a. *sĕp'tĭk* [Gr. *sēptĭkos*, that causes putrefaction—from *sēpō*, I make putrid or rotten]: having the power to promote putrefaction. SEP'TICALLY, ad. *-lĭ*. SEPTICITY, n. *sĕp-tĭs'ĭ-tĭ*, the tendency to promote putrefaction. SEPTICÆMIA, n. *sĕp'tĭ-sē'mĭ-ă*, or SEPTÆMIA, n. *sĕp-tē'mĭ-ă* [Gr. *haima*, blood]: acute disease, resembling pyæmia in its general characters, supposed to be caused by absorption into the blood of putrid matter from the surface of a wound or ulcer; the putrefaction being now known to be a fermentative change due to the presence of certain micro-organisms in the blood. The disease is called also ICHORRHÆMIA, *īk'ŏr-rē'mĭ-ă* [Gr. *ichōr*, corrupted matter; *haima*, blood], and SEPTIC PYÆMIA: see PYÆMIA.

SEPTICIDAL, a. *sĕp'tĭ-sī'dăl* [L. *septum*, a partition; *cædo*, I cut or divide]: in *bot.*, applied to seed-vessels which open by dividing through the septa of the ovary.



Septicidal Dehiscence: *v*, valves; *d*, dissepiments; *c*, axis.

SEPTIFEROUS, a. *sĕp-tĭf'ĕr-ŭs* [L. *septum*, a partition; *fero*, I bear]: containing septa; having partitions.

SEPTIFORM, a. *sĕp'tĭ-fawrm* [L. *septum*, a partition; *forma*, shape]: resembling a septum or partition.

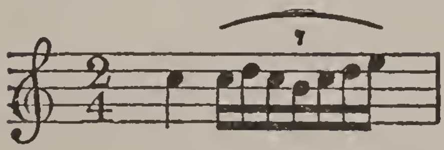
SEPTIFRAGAL, a. *sĕp-tĭf'ră-găl* [L. *septum*, a partition; *frango*, I break]: in *bot.*, applied to a dehiscence which takes place along the lines of suture, the valves at the same time separating from the dissepiments, which are not sub-divided.

SEPTILATERAL, a. *sĕp'tĭ-lăt'ĕr-ăl* [L. *septem*, seven, and *latus*, a side, *latĕris*, of a side]: having seven sides.

SEPTILLION, n. *sĕp-tĭl'yŭn* [L. *septem*, seven, and Eng. *million*]: in *arith.*, a million raised to the seventh power; in *Eng. notation*, expressed by a unit followed by 42 ciphers—in the *It.* or *F.*, by a unit and 24 ciphers.

SEPTIMAL, a. *sĕp'tĭ măl* [L. *septĭmus*, seventh; *septem*, seven]: relating to the number seven.

SEPTIMOLE, *sĕp'tĭ-mōl*, in Music: group formed when a note is divided into seven instead of four parts—e.g., a minim into seven quavers, or a crotchet into seven semiquavers. The figure 7 is usually placed over it. A S. may occur also in a $\frac{6}{8}$ measure, in which case the seven notes are collectively of the value, not of four, but of six.



SEPTINE, n. *sĕp′tīn* [Gr. *sēptē*, means of producing decay]: in *pathol.*, organic poison. **Septinous**, a. *sĕp′tĭ-nŭs*, produced by organic poison.

SEPTUAGENARIAN, n. *sĕp′tū-ă-jĕn-ā′rĭ-ăn* [mid. L. *septuagenārĭus*—from L. *septŭagēnī*, seventy each—from L. *septŭagin′ta*, seventy]: a person seventy years of age. **Sep′tuag′enary**, a. *-ăj′ĕn-ėr-ĭ*, consisting of seventy: N. the number seventy.

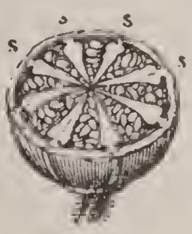
SEPTUAGESIMA, n. *sĕp′tū-ă-jĕs′ĭ-mă*, i.e., Septuagesima Sunday [L. *septŭages′ĭmus*, 70th]. third Sunday before Lent (q v.)—so called because 70 days (in round numbers) before Easter. **Sep′tuages′imal**, a. *-ĭ-măl*, consisting of seventy; counted by seventies. **Sep′tuages′imally**, ad. *-lĭ*.

SEPTUAGINT, n. *sĕp′tū-ă-jĭnt*, or The Seventy, or Alexandrine Version (often denoted by LXX.) [L. *septŭagin′ta*, seventy]: most ancient extant Greek translation of the Hebrew Old Test., and the one in common use in Palestine in the time of Christ: Adj. pertaining to the Septuagint, or contained in it.—The *Septuagint*, as to its origin, is shrouded in obscurity. The principal myth about it—repeated by Philo, Josephus, the Talmud, and the Church Fathers (Justin, Clement of Alexandria, Epiphanius, etc.), with individual variations—is in a letter purporting to be written by a Greek, Aristeas, to his brother, Philokrates, during the reign of Ptolemy Philadelphus (B.C. 284–247). This king, the letter says, anxious to embody in a collection of laws of all nations, on which he was engaged, those of the Jews also, invited, by the advice of his librarian, Demetrius Phalereus, 72 men of learning and eminence from Palestine, who performed the task of translation from the original Hebrew (on the isle of Pharos) in 72 days. This legend is utterly rejected as history, and the letter is proved beyond all question spurious. The legend, however, had doubtless some basis of facts from which it was developed; but these facts it is not now possible to ascertain. So much, however, seems clear from another anterior testimony (Aristobulos), that Ptolemy did cause a Greek version of the Pentateuch to be executed, probably during the time of his being co-regent of Ptolemy Lagi. That the translator or translators, however, were not Palestinian but Egyptian Jews, appears equally clear both from the state of the text from which their translation must have been made, and from the intimate acquaintance with Egyptian manners and customs which it evinces. This text differs, especially in the Pentateuch, considerably from our received text, but agrees in many instances with the Samaritan (q.v.). The question of the number of translators has been much discussed, with little positive result. So much only seems certain, that different hands were employed in rendering the different parts of the Pentateuch, on which immense care was bestowed, as well as of the other books of the Old Test., though the other books do not seem to have been done at the same time. In some instances, it appears as if the translation had been made before the non-pentateuchial books were united with the others into one canon. This seems evident in the case particularly of the book of Jeremiah, which, in the translation, appears in a more primitive form than that in which we possess it now. In less degree does this discrepancy appear in Job, the Proverbs, Daniel, and Esther; of these, however, our canon probably contains the original form, while the LXX. shows later variants. It is, however, in none of these books to be decided now whether the discrepancies observable are due to an already altered text on which the translators worked, or whether the translators were their own emendators; or even whether many of the changes are not due to a much later period. The translation of the book of Daniel is the most flagrant instance of subsequently introduced 'corrections' and additions. Apart from the apocryphal pieces attached to it, its obscure passages were 'emendated' to such an extent, by both Jews and Christians, that it was by the authority of the early church utterly rejected, and replaced by the version of Theodotion. The translator of Job, though less arbitrary, has yet altered, added to, and abbreviated considerably, his text. Esther has many apocryphal additions, which owe their origin probably to the Alexandrine period, and never existed in Hebrew. Of exaggerated literalness is the version of Ecclesiastes and the Psalms. Among the most successful books are the Psalms and Ezekiel. But, on the whole, there is noticeable throughout a lack of exact knowledge of the original; a striving after minute fidelity in one part, and an unbridled arbitrariness in another; further, a desire to tone down or to utterly eliminate anthropomorphisms or anything that appeared objectionable to the refined taste of the time.

The Septuagint was held in the very highest repute among the Alexandrine Jews, while the Palestinians at first regarded it as a dangerous innovation, and even instituted the day of its completion as a day of mourning. Gradually, however, it found its way into Palestine also; and at the time of the composition of the New Test., it seems almost to have superseded the original, considering that the New Test. quotations from the Old Test. are almost invariably given from the LXX. It was read and interpreted in the synagogues for several centuries after Christ, until the increasing knowledge of the original, fostered by the many academies and schools, and the frequent disputations with the early Christians, brought other and more faithful and literal translations, such as those of Aquila, Theodotion, etc., into use, and gradually the LXX. was altogether discarded in the synagogue. The church, however, for a long time, and the Greek Church to this day, considered it as of equal authority and inspiration with the Hebrew text itself; and many translations were made from it into the vernaculars of different Christian communities (the Itala, the Syriac, the Ethiopian, Egyptian, Armenian, Georgian, Slavonian, etc.). The large diffusion of the LXX. among the Hellenists and in the churches, and the lack of anything like a critically fixed text, together with the pious desire bodily to insert the peculiar explanation given to obscure passages by single authorities, the ignorance of the copyists, and a number of other causes, contributed not a little to render the MSS. corrupt, in some instances past mending. Nor were the endeavors of Origen (q.v.) in his *Hexapla*, or of Lucianus and Hesychius, for restoration of the proper text, of any avail.

The study of the Septuagint is very important as the starting point for the history of Jewish interpretation of the Scriptures. Also the S. preserves some ancient Hebrew books which were excluded from the canon. It presents to us the dialect of biblical Greek under systematic rules, and is a lexical help in our interpretation of the New Test. And chiefly it is a help as furnishing the only version with which we can compare the Masoretic text of the Old Test.—The principal MSS. that have, as far as we know, survived are the Codex Alexandrinus in the Brit. Museum, the Codex Vaticanus in Rome, and the Sinaitic Codex (imperfect) in St. Petersburg; all dating between the 4th and 6th c. The principal editions are the Complutensian (1514–17), reprinted in the Antwerp and Paris Polyglot; the Aldine of Venice (1518); the Sixtine of Rome (1587), partly reprinted in Walton's Polyglot (1657) by Lamb Bos. (Franeker 1709); Reineccius (Leip 1730); Parsons and Holmes (Oxford 1798–1827); Tischendorf (1850, etc.). Following more closely the Codex Alexandrinus is the edition of Grabe (Oxford 1707–20, completed by F. Lee), reprinted by Breitinger (Zurich 1730–32) and others. The Alexandrine Codex has been reproduced in fac-simile by H. H. Baber; the Sinaitic in the same manner by Tischendorf. Some other MS. recensions are mentioned by the early Fathers; e.g., the 'Hebrew,' the 'Syrian,' the 'Samaritan,' the 'Hellenian,' etc. The literature of the LXX. is very large, and special grammars and dictionaries have been compiled for its peculiarly corrupt idiom.

SEPTULATE, a. *sĕp'tū-lāt* [L. *septum*, a partition (see SEPTUM)]: in *bot.*, applied to fruits having spurious transverse dissepiments or partitions. SEP'TULUM, n. *-lŭm*, a division between small spaces or cavities.



s, s, Septa.

SEPTUM, n. *sĕp'tŭm*, SEP'TA, plu. *-tă* [L. *septum*, a partition—from *sepĭō*, I fence; *sepes*, a hedge]: in *bot.*, any partition separating a body, as a fruit into two or more cells in the direction of its length—separating partitions across or in the direction of its breadth are called *phragmata;* in *anat.*, the membrane or plate separating from each other two adjacent cavities or organs; one of the partitions or walls of a chambered shell SEP'TULÆ, n. plu. *-tū-lē*. a dimin. of septum.

SEPTUPLE, a. *sĕp'tū-pl* [F. *septuple*—from L. *septem*, seven; *plico*, I fold]: sevenfold: V. to make sevenfold. SEP'TUPLING, imp. *-plĭng*. SEP'TUPLED, pp. *-pld*.

SEPUL'CHRAL MOUND: mound of earth or stone over the resting-place of the dead. The rearing of such mounds may be traced to remote antiquity. It had doubtless its origin in the heap of earth displaced by interment, which, in the case of the illustrious warrior or chief, it became the practice to raise into the size and form of the barrow or tumulus which is found all over n. Europe, from Great Britain and Ireland to Upsala in Sweden and the Steppes of Ukraine. Sepulchral mounds of some sort seem, indeed, to have been erected among all the nations of Asia as well as of Europe, and they are found in numbers in Central America. Some of the larger tumuli or moat-hills are but partially artificial, natural mounds having been added to or shaped into the form which it was wished that they should take. There is considerable diversity in the form of the tumuli, the different forms corresponding to different periods, considerably remote from each other. The oldest are long-shaped, and in the form of gigantic graves, often depressed in the centre, and elevated toward one end. Inside the tumulus the body was laid at full length, often with spear and arrow heads of flint and bone. The bell and bowl shaped tumuli seem to have succeeded this early form. Within is often found a short cist and primitive cinerary urn, showing that the body had been burned; but there appears evidence also that the processes of inhumation and cremation had been in use contemporaneously, or sometimes the body was placed within the cist in a sitting posture. Skeletons of dogs and horses are occasionally found beside the ashes of the deceased. The sepulchral mounds which seem of latest date are broad and low, surrounded sometimes by an earthen vallum, and sometimes, particularly in Scotland and Scandinavia, by a circle of standing stones. In both the inclosed and encircled tumuli, weapons have been found belonging to the period when the metallurgic arts were practiced, and in some instances Roman as well as native relics. A remarkable form of tumulus frequent in Sweden, and occasionally seen in Scotland, consists of an oblong mound larger than the primitive barrow, and terminated at both ends in a point, whence it has been called the *skibs œlunger*, or ship-barrow. Scandinavian antiquaries have come to the conclusion that the bodies of the warriors of the deep were sometimes burned in their ships, whose form was repeated in the earth-work reared above their ashes.

The most numerous class of sepulchral mounds in Scotland are the *Cairns* (q.v.) or tumuli of stone, which abound in every district, and were often much larger than the earthen tumuli. Another species of monument is the *Cromlech* (q.v.).

SEPULCHRE, n. *sĕp'ŭl-kėr* [OF. *sepulchre*—from L. *sepulcrum*, a tomb—from *sepel'ĭō*, I bury: It. *sepolcro:* F. *sépulcre*]: a place of interment; a tomb; a grave: V. to bury; to inter. SEP'ULCHRING, imp. *-krĭng*. SEP'ULCHRED, pp. *-kėrd*. SEPULCHRAL, a. *sĕ-pŭl'krăl*, pertaining to burial, or to tombs or monuments; deep, grave, or disagreeably hollow, generally applied to a tone of voice. SEPUL'CHRALLY, ad. *-lĭ*. SEPULTURE, n. *sĕp'ŭl-tūr* [F.—L. *sepultūra*, an interment]: interment; burial.

SEP'ULCHRE, THE HOLY: see HOLY PLACES.

SEPULVEDA, *sā-pôl'vā-thâ*, JUAN GINES DE: Spanish historian, surnamed the Livy of Spain: about 1490–1573 or 4; b. Pozo-blanco, near Cordova. He studied first at Cordova and Alcala, and went to Bologna 1515, where he wrote the life of Cardinal Albornoz, pub. 1521. He assisted Cardinal Cajetan at Naples in revising the Greek text of the New Test., and 1536 returned to Spain as chaplain and historiographer to Charles V., and preceptor to his son, afterward Philip II. S. seems to have been one of the most learned men and best writers of his time. His works comprise Latin translations, and miscellaneous dissertations. His histories of the Reign of Charles V., of Philip II., and of the Conquests of the Spaniards in Mexico, all in Latin, are still inedited. His other works were pub. by the Royal Acad. of History, Madrid, 1780 (4 vols. fol.).

SEQUACIOUS, a. *sĕ-kwā'shŭs* [L. *sequax* or *sequācem*, following or seeking after—from *sequi*, to follow]: not moving on independently; following; attendant; logically consistent and rigorous; in *OE.*, ductile; pliant. SEQUA'CIOUSNESS, n. *-nĕs*, or SEQUACITY, n. *sĕ-kwăs'ĭ-tĭ*, disposition to follow; act of following.

SEQUEL, n. *sē'kwĕl* [F. *séquelle*—from L. *sequēla*, a result or consequence—from *sequor*, I follow: It. *sequela*]: that which follows; consequence; result; event; conclusion. SEQUELA, n. *sĕ-kwē'lă*, in *med.*, a diseased state following on an attack of some other disease. SEQUE'LÆ, n. plu. *-lē*, disordered conditions of society following upon severe famine and widespread fatal disease.

SEQUENCE, n. *sē'kwĕns* [F. *séquence*—from L. *sequens* or *sequen'tem*, following—from *sequor*, I follow]: that which follows; order of succession; series; arrangement; a set of cards of the same suit in order; in *music*, a regular alternate succession of similar chords; in *Rom. Cath. Chh.*, a hymn introduced into the Mass on certain festival days *after* the gradual—whence the name. SEQUENT, a. *sē'kwĕnt*, in *OE.*, following; succeeding; consequent: N. in *OE.*, a follower. SEQUENTIAL, a. *sĕ-kwĕn'shăl*. being in succession. SEQUEN'TIALLY, ad. *-lĭ*.

SEQUESTER, v. *sĕ-kwĕs'tėr* [F. *séquestrer*, to sequester—from L. *sequestrārĕ*, to give up for safe-keeping—from *sequester*, a depositary, a mediator: It. *sequestrare*]: to separate from others; to withdraw or retire, as from society; to seclude; to sequestrate. SEQUES'TERING, imp. SEQUES'TERED, pp. *-tėrd:* ADJ. secluded; retired. SEQUES'TRABLE, a. *-tră-bl,* capable of being sequestered or separated. To SEQUESTER ONE'S SELF, to separate one's self from society; to seclude one's self for the sake of privacy. SEQUES'TRATE, v. *-trāt* [L. *sequestrātus*, removed, separated from anything]: especially in *eccles. usage*, to appropriate by legal process the property and income of an incumbent until the claims of certain creditors are satisfied; to set aside from the power of either party the matter at issue by order of a court of law; in *Scotch law*, to take possession of the estate of a bankrupt or insolvent with the view of realizing it and distributing it equitably among the creditors. SEQUES'TRATING, imp. SEQUES'TRATED, pp.: ADJ. taken possession of for behoof of creditors. SEQUESTRATION, n. *sĕk'-wĕs-trā'shŭn* [F.—L.]: esp. in *eccles. practice*, the act or state of taking possession of a benefice by legal process, in order to satisfy the claims of creditors; deprivation of the use and profits of a possession; in *OE.*, state of being set aside. SEQ'UESTRA'TOR, n. *-trā'tėr*, one who sequestrates.

SEQUESTRUM, n. *sĕ-kwĕs'trŭm* [L. *sequester*, a mediator (see SEQUESTER)]: in *surg.*, a dead portion of bone which separates from the sound part.

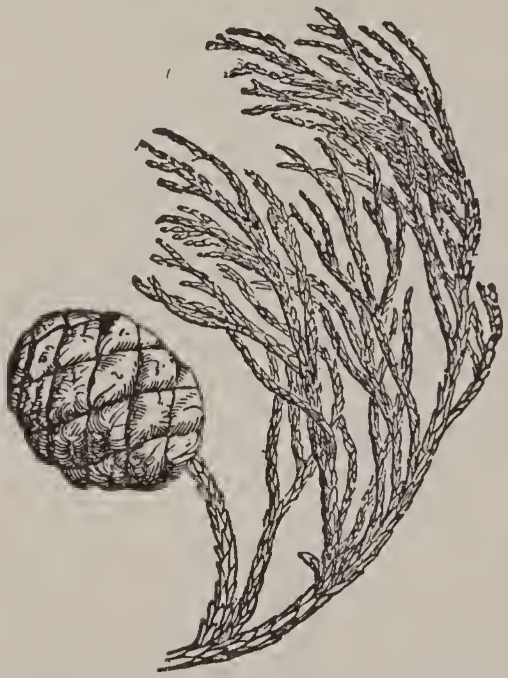
SEQUIN, n. *sē'kwĭn* [F. *sequin;* It. *zecchino*, a sequin—from It. *zecca*, the mint—from Ar. *sikkat*, a die for coins]: a gold coin of Italy, struck first at Venice about the end of the 13th c. It was about the size of a Ducat (q.v.), and was equivalent to about $2.30. Coins of the same name, but varying in value, were issued by other states.

Sequin.

SEQUOIA, *sē-kwoy'â:* a genus including the *S. gigantea*, the greatest of all pines. The Americans refer the Wellingtonia of English gardens to the genus *Sequoia*, which contains two species, *S sempervirens* and *S. gigantea.* The genus belongs to the tribe *Abietineæ* (spruces and firs), and to the sub-tribe *Taxodinæ*, which contains the Bald or Southern Cypress. The foliage of the *S. gigantea* is similar to that of an arbor vitæ, the leaves being very small, like scales, and closely appressed to small slender branchlets. The leaves of young plants are longer and somewhat needle-shaped. The branches divide into very numerous small branchlets. The flowers are generally solitary and terminal, the male and female flowers distinct, but on the same tree. The cones of the *S gigantea* are ovate, 1½ to 2 inches long, by 1½ inch broad, single, or in opposite pairs, rarely clustered, the scales wedge-shaped, with about four seeds under each. The *S. gigantea* has a columnar stem, with branches only on the upper half of it, the branches of comparatively small size, and not forming an umbrageous head. The stem attains a height of 300 ft., and sometimes more, perfectly straight and erect. One tree is known 321 ft. in height; and near it lies a larger one, which has fallen, and which was broken against

Sequoia gigantea: The Three Graces.

another large tree in its fall, its diameter where it was broken, 300 ft. from its base, being 18 ft. In 1890 a tree was discovered in Fresno co., Cal., measuring 143 ft. 5 in. at the base. The greatest girth previously reported was a little over 100 ft. The S. is found only in a limited district in California, on the Sierra Nevada, 4,000 to 5,000 ft. above the sea. It was discovered 1850 by a deer-hunter, who came with astonishment into the midst of a group of these trees, now known as the Mammoth Trees of Calaveras. There, within an area of 50 acres, are 123 large trees, 20 of which exceed 25 ft. in diameter at the base, and are therefore about 78 ft. in circumference. A tree which was felled was 302 ft. in height, and 96 ft. in circumference at the ground: it was sound to the centre. Its age may be guessed at about 3,000 years. It was calculated to contain about 500,000 cubic ft. of timber. Five men were employed 22 days in felling it, by boring great auger-holes and sawing between them. When it had been cut through, it remained steadfast on its base, and more than two days were spent in driving in great wedges, to cause it to fall. A round wooden house has been erected on the stump, where dances are sometimes held. For several years the Mammoth Trees of Calaveras were supposed to be the only trees of their kind in existence; but groups have been found in other parts of the same district, and scattered trees in other places. The loftiest Sequoia does not exceed 325 ft., and is greatly surpassed by the eucalyptus-trees of Australia and Tasmania, many of which are 250 to 350 ft high: and as some are 18 to 20 ft. in diameter, they probably contain more timber than any Sequoia, though these are proportionately thicker at the base.



Cone and Foliage of the *Sequoia gigantea.*

SERAGLIO, n. *sĕ-răl'yō,* properly *Seraï* [It. *serraglio,* an inclosure of palisades, a place shut in—from *serrare,* to lock in—from L. *sera.* a bar; *sero,* I join: afterward confused with Pers. *seraï,* a palace: F. *sérail,* a seraglio]: the palace of the grand seignior or sultan of Turkey: place or house for keeping wives and concubines; a harem—hence, a house of licentious pleasure.—The *Seraglio* of the sultan at Constantinople stands in a beautiful situation on a head of land projecting into the sea, on the shore of the Golden Horn; and is inclosed by walls 7½ m. in circuit. Within the walls are a variety of mosques, gardens, and large edifices, capable of containing 20,000 persons, though the whole number of the inhabitants scarcely ever reaches half of this. The principal entrance (*Babi Humayun,* or Sublime Gate) is a kind of pavilion, constantly guarded by *capidjis,* or officers of the S.; and the chief of the large edifices within is the *harem* [Ar., sacred spot], which is distinctly separated from the rest of the S., and consists of a group of houses and gardens, one of each being possessed by each of the sultan's wives, and of the habitations of the concubines and slaves. The harem is ruled by the *kiaja-khatun,* or inspector of the women, who is under the sultan's authority alone, and is supplied with what they require by the *kislar-aga,* or chief of the black eunuchs, who form the principal or inner guard of the harem. The second and outer guard is given to the white eunuchs, under their chief, the *kapu-agassy* or *kapu-oghlan.* Other classes of household officers are the *mutes* (Turkish, *bisebân* or *dilssis*), who, till recently, were the executers of the sultan's orders, especially those in which secrecy was required; the *bostanjis,* or gardeners; the *baltajis,* or cleavers of wood; and the *itsh-oghlans,* or attendants of the sultan. The sultan's mother always resides within the S., but his sisters do not. Access may easily be had to the S., except the harem, which is scrupulously guarded from even the eyes of strangers. The English have improperly confounded the two terms 'seraglio' and 'harem.'

SERAI, n. *sĕ-rī'* [Pers. *seraï,* a palace, an inn]: in *India* and *Tartary,* a resting-place for the accommodation of travellers; a caravansary.

SERAING, *séh-răng':* town of Belgium, province of Liége, between three and four m. s.w. from Liége, on the right bank of the Meuse; on the railway between Namur and Liége. It is connected by a handsome suspension-bridge with the village of Jemeppe, on the left bank of the Meuse. S. is a place of great activity, and contains a manufactory of steam-machinery, locomotives, etc., one of the largest in the world. This manufactory was established by an Englishman, John Cockerill, 1816; the king of Holland, to whose dominions Belgium then belonged, joining in the enterprise. After the revolution of 1830, Cockerill bought the shares belonging to the king of Holland. On his death 1840, a company was formed, *La John Cockerill Société,* to which the works now belong. They occupy the former palace of the prince-bishops of Liége, which still forms their front, the extensive gardens behind it having been covered with buildings, where all processes of machine-making are carried on. Forty or fifty tall chimneys are clustered on this spot. The town depends on these works for its prosperity. Pop. (1890) 33,912; (1900) 38,468.

SERA'JO, or SERAIEVO: see BOSNA-SERAI.

SERAL, a. *sē'ral* [L. *sero*, late]: in *geol.*, late; an epithet expressing the period of the night-fall or late twilight of the Appalachian Paleozoic day. The coal-measures of N. America occupy an area of 200,000 sq. m., and range from 3,000 ft. to such thickness as to be unworkable. From the fossils it is evident that the Appalachian Seral series is the equivalent of the European Carboniferous series.

SERALBUMEN, n. *sĕr'ăl-bū'mĕn* [Eng. *serum*, and *albumen*]. a name given to the albumen of the blood to distinguish it from the albumen of the egg, called *ovalbumen.*

SERAMPORE, *sĕr-am-pōr'*, or SERAMPUR: neat town of Brit. India, built in European style, extending a mile along the right bank of the Hooghly, 14 m. n. of Calcutta. Paper is here manufactured in large quantity. S. was at one time a Danish settlement, but was transferred by purchase to the Brit. 1845. Pop. about 26,000.

SERANG': see CERAM.

SERAPE, n. *sĕ-râ'pĕ* [Sp.]: a blanket or shawl worn as an outer garment by the Mexicans and other natives of Spanish N. America.

SERAPEUM, *sĕr-a-pē'ŭm* (Gr. *Serapeion* or *Sarapeion*): temple named in honor of Serapis (q.v.). Several such temples are known to have existed in the ancient world. The most remarkable was that of Alexandria, situated s. of the canal, and outside the walls of the city, and superseded an older temple at Rhacotis. Hither was transported the statue of Dis or Pluto from Sinope by Ptolemy I., and attached to it was the celebrated Alexandrian Library (q.v.). The S. at Memphis attained scarcely less reputation, and comprised a group of temples dedicated to Astarte, Anubis, Imouthos or Æsculapius, and Serapis. It was approached from the city of Memphis by an avenue of sphinxes, which had already become partially buried in the sands in the days of Strabo, and were discovered by M. Mariette 1850, who, after a series of excavations, uncovered the ruins, and discovered the cemeteries of the mummied Apis or Bulls sacred to Ptah and Osiris at Memphis. Close to the S. was the Apeum, or temple of the living Apis, in which the bull lived, as well as the cow which had produced him. The S., or, as it was called in Egyptian, the abode of *Osorhapi*, or the Osiris-Apis, was, in fact, the sepulchre of the bull. The most remarkable part of the work, which was of great extent, was the subterranean tombs of the mummies of the Apis, consisting of galleries with numerous chambers, in which the remains of these bulls had been deposited from the reign of Amenophis III. of the 18th dynasty, about B.C. 1400, till the time of the Romans. Two principal galleries contained the tombs. The second gallery, commenced in the 53d year of Psammetichus I., was on a grander scale than the first, with larger sepulchral chambers, and magnificent sarcophagi of granite, some measuring 12 ft. high, 15 ft. long, and weighing many tons. During the reign of the Persians, and subsequently, the chambers were of less size, and the monuments exhibit the general decadence of the arts. The Apis, considered as the incarnation of the god Ptah during life, received royal and divine honors after death; his body, or the principal portion, being embalmed, and a sepulchral tablet or tombstone placed on his sepulchre, with other tablets of different worshippers, who adored his divinity, and dedicated them to the deceased bull. As the principal tombstone of the bull contained the dates of the king's reign in which he was born or discovered, enthroned in the Apeum, and died or was buried in the S., these tablets have become an important element for the chronology of the 19th and subsequent dynasties, and have aided to fix some hitherto doubtful points of chronology. They terminate with Ptolemy Euergetes II., B.C. 177. The tablets, votive and sepulchral, numbered about 1,200; the most remarkable are at present in the Museum of the Louvre at Paris. Numerous bronze figures and other antiquities were found during the excavations, comprising costly objects of jewelry, many of which also are in the Louvre. Besides these, several Greek papyri which appear to have formerly belonged to the library or archives of the S. were previously known, and many have been published. These throw great light upon the constitution of the hierarchy of the S., among which was a kind of order of monks, who lived within the precincts of the building, beyond which they did not go, and subsisted on alms or the contributions of their family.—Mariette, *Serapeum de Memphis* (4to Paris 1856); *La Mère d'Apis* (4to Paris 1856); *Athen. Fran.* (4to Paris 1855-6); Lepsius, *Ueber den Apis-kreis, Zeitsch. d. Morg. Gesell.* (8vo Leip. 1853).

SERAPH, n. *sĕr'ăf* [conjecturally from Heb. *saraph*, to burn—possibly from an Arabic term denoting *high, exalted:* It. *serafino:* F. *séraphin*]: high order of celestial beings: Heb. plu. SER'APHIM, *-ă-fĭm:* Eng. plu. SERAPHS: sometimes the plu. is written *seraphims*, but improperly. The Seraphim were celestial beings in attendance on Jehovah, mentioned only Is. vi. 2. They have some resemblances to the Cherubim (q.v.), have the human form—face, voice, two hands, and two feet—but six wings, with four of which they cover their face and feet—as a sign of reverence—while with two they fly. Entirely uncertain is the origin of this conception, or of the word which expresses it: their office of singing the praises of Jehovah on his throne, and of being the swift messengers between heaven and earth, gives little explanation of it. They may probably be classed, not with the angels, who are presented as living personal beings, but with the cherubim (see CHERUB), as poetic symbols, vision-emblems of the splendor and power of Jehovah's majesty. Deserving of consideration, in view of the close contact between Judæa and Assyria and Babylon both before and after the Captivity, is a comparison between the seraphim and sculptures of winged men and beasts brought to light in these last-named countries. SERAPHIC, a. *sĕ-răf'ĭk,* or SERAPH'ICAL, a. *-ĭ-kăl,* angelic; pure; sublime; inflamed with love or zeal. SERAPH'ICALLY, ad. *-lĭ.* SERAPHINE, n. *sĕr'ă-fĭn,* keyed musical instrument in which the sounds were produced by action of wind on free vibratory reeds. It was the precursor of the Harmonium (q.v.).

SERAPIS, *sē-rā'pĭs,* or SARAPIS, *sa-rā'pĭs:* Greek name of an Egyptian deity, introduced into Egypt in the time of Ptolemy I., or Soter. This monarch is said to have seen the image of a god in a dream, commanding him to remove it from the place where it was; and Sosibius, a traveller, having recognized the image as existing at Sinope, Soteles and Dionysius were sent from Egypt, and brought it from Sinope to Alexandria. On its arrival, it was examined by Timotheus the interpreter and the celebrated Manetho, who called it Serapis, and appear to have identified it with Osorapis, or Osiris united with Apis, i.e., Osiris in his character of the Egyptian Pluto, as a deity of similar character. The figure, in fact, appears to have been one of Hades or Pluto, having at its side Cerberus and a dragon or snake. According to some authorities, the statue of S. was sent to Ptolemy II., or Philadelphus, because that monarch had relieved the city of Sinope from famine by supplying it with corn, and the statue was placed in the Serapeum (q.v.) at the promontory of Rhacotis. The S. of the Ptolemaic period, however, was not an Egyptian but a Greek deity, whose temple was not admitted into the precincts of Egyptian cities, and found favor only in the Greek cities founded in Egypt. It is said that 42 temples were erected under the Ptolemies and Romans to this god in Egypt. His resemblance to Osiris consisted in his chthonic or infernal character, as judge of the dead and ruler of Hades. About his nature and attributes the Greeks themselves entertained very different ideas, some considering him allied to the Sun, others to Æsculapius or Hades. The god had a magnificent temple at Alexandria, to which was attached the celebrated Library; another at Memphis, in the vicinity of the cemetery of the mummies of the Apis, which has been excavated by M. Mariette; and another at Canopus. From recent discoveries, it appears that he represented or was identified with the Hesiri Api, or Osorapis, the 'Osirified' or 'dead Apis,' who was also invested with many of the attributes of Osiris, and considered, while living, to be the incarnation of the god Ptah Socharis-Osiris, the tutelary divinity of Memphis. The worship of S., introduced into Egypt by the Ptolemies, subsequently became greatly extended in Asia Minor; and his image, in alliance with that of Isis and other deities, appears on many of the coins of the imperial days of Rome. In A.D. 146 the worship of the god was introduced into the city of Rome by Antoninus Pius, and the mysteries celebrated on

Serapis.
From a Seal in the Brit. Museum.

May 6; but they were soon abolished by the senate, on account of their licentious character. A celebrated temple of S. was also at Puteoli (Pozzuoli), near Naples, and the remains of it are still seen, and present curious geological phenomena. In Egypt itself, the worship of the deity subsisted till the fall of paganism, the image at Alexandria continuing to be worshipped till destroyed, 398, by Theophilus, abp. of that town. Busts of S. are found in most museums, and his head or figure engraved on certain stones was supposed to possess particular mystic virtues. His temples were oracular, the votaries consulting him by sleeping and dreaming in them; and at Alexandria the priests connected his worship with the healing art.—Plutarch, *De Isid*, s 28; Clemens, *Orat. Adhort.* p. 21; Tacit. *Hist.* iv. c. 83, 84; Strabo, Lib. xvii. 552; Macrobius, *Saturn*, i. 7, 25; Nixon, *Dell' Edifizio di Pozzuoli detto il Tempio di Serapide* (Nap. 1773); Wilkinson, *Mann. and Cust.* iv. 360; Gibbon, *Decline and Fall*, c. 28.

SERASKIER, or SERASQUIER, n. *sĕ-răs'kēr* [F. *sérasquier*—from Pers. *ser*, head, chief; *asker*, an army]: name given by the Turks to every general having the command of a separate army; and, in particular, to the commander-in-chief or minister of war of the Sublime Porte. The S. in the latter sense possesses most extensive authority, being subordinate only to the sultan and grand vizier; he is selected by the monarch from among the pashas of two or three tails. SERAS'KIERATE, n. *-kēr-āt*, office of the seraskier.

SERB, n. *sėrb* [native name]: native or inhabitant of Servia.

SERBONIAN, a. *sĕr-bō'nĭ-an:* term formerly applied to the bog or lake of Serbonis, on the Mediterranean coast of Egypt, from 30° 20′ to 31° e. long. It was surrounded by hills of loose sand, which being carried into the water by high winds so thickened the lake that it could not be distinguished from the land. Whole armies are reported to have been swallowed up in it. Hence the phrase Serbonian bog for a difficulty from which there is no way of extrication.

SERE, a. *sēr* [see Sear]: dry; withered.

SEREIN, n. *sĕr′īn* [F., evening dew—from L. *sērum*, a late hour: confused with L. *serēnus*, bright, clear]: a kind of fine rain or heavy dew which falls sometimes in a clear sky.

SERENADE, n. *sĕr′ĕ-nād′* [F. *sérénade*—from It. *serenata*, a serenade—from It. *sereno;* L. *serēnus*, open, fair, clear—applied to the weather or the open air, espec. of a calm, clear night. as opposed to indoors]: an entertainment of music given by a lover in a spirit of gallantry under the window of his lady-love at night; in *Ger.*, a musical tribute given at night by students to a favorite professor under his window: soft music performed in the streets during the stillness of night, practiced chiefly in Spain and Italy: a musical piece suitable for such an occasion, called sometimes *Nottorno:* V. to entertain with open-air music at night. Ser′ena′ding, imp.: N. the act or practice of performing music in the open air at night. Ser′ena′ded, pp. Ser′ena′der, n. *-dėr*, one who serenades. Ser′ena′ta, n. *-nâ′tă* [It.]: any piece of vocal music on the subject of love; an orchestral work in symphony form; pastoral cantata.

SERENE, a. *sĕ-rēn′* [L. *serēnus*, fair, bright, serene: It. *sereno:* F. *serein*, serene]: clear and calm; still; peaceful; unruffled; even-minded; calm in temper; a title or form of address restricted to the sovereign princes of Germany and the members of their families, as *Serene Highness, Most Serene:* N. clearness; tranquillity. Serene′ly, ad. *-lĭ*. Seren′ity, n. *-rĕn′ĭ-tĭ*, clearness and calmness; peace; calmness of mind. Sérénissime, n. *sā′rān-ĭs′sēm* [F.—It. *serenissimo*]: most serene, as a form of address.

SERES, *sĕr′ĕs* (anc. *Seris, Siræ*, or *Sirrhæ*): town in Macedonia, European Turkey, in the vilayet of Salonica, 47 m. n.e. of the town of Salonica. It is on a tributary of the Strymon or Karassu, and on a broad and fertile plain containing several hundred villages. Among the important buildings of S. are the Greek archiepiscopal palace, the Greek cathedral, destroyed by fire 1879 and since restored, the Greek gymnasium (of marble) and hospital, the Aghia Sophia mosque, and the remains of an old fortress said to have been built by Helen. It has a number of Greek churches, several mosques, baths, and benevolent institutions. It manufactures cotton and woolen goods, and exports cotton, grain, tobacco, and rice. Pop. 25,000.

SERETH, *sér-ĕt′* or *sā-rĕt′:* important affluent of the Danube, rising in the Austrian crown-land of Galicia, flowing s. through almost the whole length of Moldavia, and joining the Danube 5 m. above Galatz, after a course of 300 miles.

SERF, n. *sėrf* [F. *serf*, a bondsman—from L. *servus*, a slave: It. *servo*]: lowest class of servants or slaves in the middle ages, who were attached to the soil and transferred with it; in *Russia* till 1863, one of the peasant class. SERF'AGE, n. *-āj*, or SERF'DOM, n. *-dŏm*, state or condition of a serf.—The *Serfs* or villeins were a numerous class of the population of Europe, who were in a state of slavery during the early middle ages. See SLAVERY. In some cases, this serf population consisted of an earlier race, who had been subjugated by the conquerors; but there were also instances of persons from famine or other pressing cause selling themselves into slavery, or even surrendering themselves to churches and monasteries for the sake of the benefits to be derived from the prayers of their masters. Different as was the condition of the serf in different countries and at different periods, his position was on the whole much more favorable than that of the slave under the Roman law. He had certain acknowledged rights—and this was the case particularly with the classes of serfs who were attached to the soil In England, prior to the Norman conquest, a large proportion of the population were in a servile position, either as domestic slaves or as cultivators of the land. The name *nativus*, generally applied to the serfs, seems to indicate that they belonged to the native race, earliest possessors of the soil. The powers of the master over his serf were extensive, their principal limitations being, that a master who killed his serf was bound to pay a fine to the king. and that a serf deprived of his eye or tooth by his master was entitled to his liberty The Norman conquest made little change in the position of the serf. The lowest class of serfs were the *villeins in gross*, who were employed in menial household services. and were the personal property of their lords, who might sell them or export them to foreign countries; while the most numerous class, employed in agriculture and attached to the soil, were called *villeins regardant*. These latter, though in some respects in a better position than the villeins in gross, might be severed from the land and conveyed apart from it by their lord. They were incapable of anything like a complete right to property; inasmuch as it was held, in accordance with the principles of the Roman law, that whatever the slave acquired was his *peculium*, which belonged to his lord, who might seize it at his pleasure. By a peculiarity in the usages of Britain, the condition of a child as regards freedom or servitude followed the father. and not the mother; therefore the bastards of female villeins might be free. In France and Germany, besides the classes of serf alluded to, there were others whose servitude was milder, and who were bound only to fixed duties and payments in respect of their lands.

The abolition of serfdom in w. Europe was a very gradual process, and the result of various causes. The church both inveighed against the practice of keeping Christians in bondage, and practiced manumission to a large extent. In the course of time, usage greatly modified the rights and liabilities of the serf, whose position must have been considerably altered when we find him making stipulations regarding the amount of his services, and purchasing his own redemption. The towns afforded in more than one way a means of emancipation. A serf residing a year in a borough without challenge on the part of his lord became *ipso facto* a free man; and the result of experience showed that the industry of the free laborer was quite as productive as that of the serf. At all events, serfdom died out in England without any special enactment; yet it was not wholly extinct in the latter half of the 16th c., for we find a commission issued 1574, by Queen Elizabeth, to inquire into the lands and goods of all her bondsmen and bondswomen in the counties of Cornwall, Devon, Somerset, and Gloucester, in order to compound with them for their manumission, that they might hold all their lands and goods as freedmen. In a few rare instances, liability to servile duties and payments in respect of lands seem to have continued till the reign of Charles I. In Scotland, as in England, serfdom disappeared by insensible degrees; but a remarkable form of it survived till the closing years of the 18th c.: colliers and salters were bound by the law, independent of paction, on entering to a coal-work or salt mine, to perpetual service there; and in case of sale or alienation of the ground on which the works were situated, the right to their services passed without any express grant to the purchaser. The sons of the collier and salter could follow no occupation but that of their father, and were not at liberty to seek for employment anywhere else than in the mines to which they had been attached by birth. Statutes 15 Geo. III. c. 28, and 39 Geo. III. c. 56, restored these classes of workmen to the rights of freemen and citizens, and abolished the last remnant of slavery in the British Islands.

In France, though a general edict of Louis X., 1315, purported to enfranchise the serfs on the royal domain on payment of a composition, this measure seems never to have been carried into effect, and a limited sort of villeinage continued in some places down till the Revolution. In some estates in Champagne and Nivernais, the villeins, known as *gens de main morte*, were not allowed to leave their habitations, and might have been followed by their lords into any part of France for the *taille* or villein-tax. In Italy, one great cause of the decline of villeinage was the necessity under which the cities and petty states found themselves to employ the peasant population for their defense, whom it became expedient to reward with enfranchisement. In the 11th and 12th c., the number of serfs began to decrease, and villeinage seems no longer to have had an existence in Italy in the 15th c. Over a large portion of Germany, the mass of the peasants had acquired their freedom before the end of the 13th c., but in some parts of the Prussian dominions a modified villeinage continued until swept away by the reforms of Von Stein in the 19th c.

In Russia, where the feudal system never prevailed, the early condition of the peasant was not servile. Till the 11th c., he could occupy any portion of the soil that he had the means of cultivating, the land being the property of all, and farmed on the purest communistic principles. The reduction of the peasantry to a state of serfdom, and their attachment to the soil, was gradually effected, and not completed till the close of the 16th c. The Russian peasant of the 19th c. was in some respects in as servile a condition as the feudal villein of the 12th c. in w. Europe; but this peculiarity attached to his position, that, while he himself was the property of his lord, the land which he cultivated belonged to himself—a consideration which greatly complicated the question of his emancipation. Emperor Alexander I. introduced various improvements in the condition of the peasantry, particularly those belonging to the crown, and in his reign serfdom was abolished in Courland and Livonia. The entire abolition of villeinage was effected by Alexander II., by a very sweeping measure: from 1863, Mar., the peasants, both husbandmen and domestics, have been made entirely free as regards their persons, while they have also obtained the perpetual usufruct of their cottages and gardens, and certain portions of land.—See SLAVERY.—On serfdom generally, see Hallam's *State of Europe during the Middle Ages*, chap. 2.

SERGE, n *sèrj* [F. *serge*—from L. *sērĭca*, silks—from *Sērēs*, the Chinese]: twilled worsted cloth of inferior quality; a thin woolen fabric. Silk serge is a coarse twilled silk, used for lining men's coats.

SERGE, or CERGE: see SERGES.

SERGEANT, *sâr'jènt*, JOHN: missionary: 1710–1749, July 27; b. Newark, N. J.; grandson of Jonathan S., one of the founders of Newark (1667). S. graduated at Yale 1729, and was tutor there 1731–35. In 1734 he began preaching to the Indians of w. Mass., and 1735 settled among them, and preached and taught them in their own language. When in 1736 the Mass. general court bought of the Indians their land in that region, giving to them the township of what is now Stockbridge, S. was given a sixtieth part of it, and was made permanent missionary at Stockbridge and at Kaunaumeek. He founded a school of manual labor at Stockbridge, which was continued several years after his death. He translated into the Indian language portions of the Old Test., and all of the New Test. except the book of the Revelation. In 1743 he published a *Letter on the Indians* and *A Sermon*. He died at Stockbridge.

SER'GEANT, JOHN, LL.D.: lawyer: 1779, Dec. 5—1852, Nov. 25; b. Philadelphia; son of Jonathan Dickinson S. He graduated from Princeton College 1795, studied law, began practice at Philadelphia 1799, and rose to the front rank in his profession. He became commissioner of bankruptcy 1801; was a member of the state legislature 1808–10, and of congress 1815–23; and was one of the prominent advocates of the Missouri Compromise measure 1820; was an envoy to the Panama Congress 1826; member of congress

1827–29; presided over the constitutional convention of Penn. 1830; was candidate of the whig party for vice-president 1832; and was again in congress 1837–42. He was appointed minister to England 1841, but declined to serve, and was afterward referee in a controversy involving a portion of the boundary between N. J. and Del. He died at Philadelphia.

SER′GEANT, Jonathan Dickinson: lawyer: 1746–1793, Oct. 8; b. Newark, N. J.; grandson of Jonathan Dickinson S., first pres. of Princeton. After graduating at Princeton 1762, S. studied law and practiced in N. J. In 1776 he became a member of the continental congress, taking his seat a few days after the signing of the Declaration of Independence; but during the year removed to Penn., where in July he became atty.gen. of the state. He resigned 1780, and resumed the practice of law in Philadelphia, and became prominent as counsel in many important cases, among them the settlement with Conn. of the Wyoming land troubles 1782. At the breaking out of the yellow fever in Philadelphia 1793, he was appointed one of the health committee, and devoted himself to relief of the sick, until he was taken with the fever of which he died.

SERGEANT, or Serjeant, n. *sâr′jĕnt* or *sėr′jĕnt* [F. *sergent;* OF. *serjant, sergant*, a beadle, an officer of court —from mid. L. *serviens* or *servien′tem*, a sergeant—from L. *servīrĕ*, to serve; *servus*, a servant: It. *sergente*, a sergeant, a beadle]: police-officer of superior rank: in the *army*, non-commissioned officer (see below): in *Eng.*, until lately, a lawyer of the highest rank, called a *serjeant-at-law* (see below): title given to certain of the king's servants, as *serjeant-surgeon*. (For the differing usage in spelling, see the *Note*, at end.) Ser′geantship, n. the office of a sergeant. Sergeant-major, non commissioned officer who assists the adjutant (see Sergeant, below). Color-sergeants, non-commissioned officers (see Sergeant, below). King's or Queen's serjeant, one of the serjeants-at-law who conducts the public causes of the king (see Serjeant-at-law). Common serjeant, in *London*, an officer who attends the lord mayor and the aldermen on court-days, etc. Sergeant-at-arms, officer who preserves order, apprehends offenders, etc. (see Sergeant-at-arms.) *Note.*—Serjeant, under the influence of the French *sergent*, is now commonly spelled Sergeant; both spellings are legitimate, though in the legal sense Serjeant is always retained.

SERGEANT, or Serjeant, *sâr′jėnt* or *sėr-:* non-commissioned officer of the army and marines, in the grade next above corporal. Sergeants are selected from the steadiest among the corporals, and their duties are to overlook the soldiers in barracks, and to assist the officers in all ways in the field. They also command small bodies of men as guards, escorts, etc. They vary in number and titles: in some arrangements every company has four sergeants, of whom the senior is the *color-sergeant*, and a superior class are the *staff-sergeants*, as the *quartermaster-sergeant*, *com-*

missary-sergeant, ordnance-sergeant, hospital sergeant; and above them all is the *sergeant-major.* For privileges of a S., see NON-COMMISSIONED OFFICERS. In ancient times, the rank of S. was considerably more exalted. In the 12th c., the sergeants were gentlemen of less than knightly rank (esquires), serving on horseback. Later, the sergeants-at-arms were the royal body-guard composed of gentlemen armed *cap-à-pie.*

SERGEANT-AT-ARMS: in the U. S. senate, U. S. house of representatives, and in state legislatures, officer whose duty it is to preserve order, under the direction of the presiding officer, to expel disturbers of order, to arrest and bring before the bar of the senate or house members absent without leave; and to discharge like functions. In addition, the S.-at A. of the U. S. house of representatives has charge of the financial accounts of the house with its members.—In the Eng. court of chancery, the S.-at-A. is the officer attendant on the lord chancellor, and executing writs of process, etc.

SERGEANTY, *sâr'jent-ĭ* or *sėr-*, GRAND; also, GRAND SERJEANTY or SERGEANTRY or SERJEANTRY: tenure by which lands were held in feudal times in England. After the Conquest, the forfeited lands were parcelled out by William to his adherents on condition of military services. The military tenants of the crown were of two classes: some held merely *per servicium militare,* by knight-service; others held *per sergentiam,* by grand sergeanty—a higher tenure, which involved attendance on the king not merely in war, but in his court at the three festivals of the year, and at other times when summoned. Although the word baron, in its more extended sense, was applied to both classes of crown tenants, yet it was only those holding by grand sergeanty whose tenure was said to be *per baroniam.* In its earliest stage, the distinction between the greater nobility and lesser nobility or gentry in England was, that the former held by grand sergeanty, and the latter by knight-service only. In theory, lands held by sergeanty could not be alienated or divided; but practically this came to be often done, and thus tenures by sergeanty became gradually extinct before the abolition of military holdings. Considerable misapprehension by Dugdale and later writers has arisen from a double use of the word *serviens,* or sergeant, as applied sometimes to a tenant either by grand sergeanty or knight-service who had not taken on himself the obligations attendant on knighthood.

The term petty sergeanty was applied to a species of socage tenure in which the services stipulated for bore some relation to war, but were not required to be executed personally by the tenant, or to be performed to the person of the king; e.g., payment of rent in spurs or arrows.

SERGES, n. *sėr-jĕz* [F. *cierge;* L. *cĕrĕus,* a wax-taper—from *cēra,* wax]: in *Rom. Cath. Chh.,* the great wax-candles burned before the altars.

SERGHIEVSKIY POSAD, *sĕr-ghē-ĕv'skē-ē po-sâd'*, or Troitze-Serghievsk, *troyts'ā-sĕr-ghē-ĕvsk':* town in Russia, 44 m. n.e from Moscow. It is in a beautiful country with wooded hills and valleys; and is famous for the Troitsk monastery, on the site of a church erected 1337, which became the centre of the ecclesiastical province of Moscow 1561, and is still regarded as the most sacred place in all that region. Its walls range in height from 25 to 50 ft., and are fortified by 9 towers, in one of which is a prison. Within its precincts are a hospital, a theol. acad., nine churches, and two cathedrals. Of the latter, one was built 1422, the other 1585. One of the churches has a tower 290 ft. high and a bell weighing 137½ tons. In the large rooms under this church about 200,000 dinners are annually given to pilgrims. In the town and its suburbs are a school for girls, an infirmary for aged women, several schools of low grade, and a large number of inns. The principal industry is the manufacture of carved toys, and carved and painted holy pictures, of which great quantities are sold to pilgrims. Pop., including suburbs, (1888) 31,413.

SERGIPE, *sār-zhē'pā:* maritime province of Brazil, bounded n. by the São Francisco river, which separates it from Alagoas; w. and s. by Bahia; e. by the Atlantic. According to the most recent statements, this province is the smallest in the republic; 15,000 sq. m. The shores are low and sandy, the interior mountainous. The e. part is fertile, well wooded, and produces sugar and tobacco; in the w., cattle are reared. The chief town is Sergipe del Rey (pop. about 9,000), at the mouth of the chief river—the Vasa Barris.—Pop. of province (1888) 232,640.

SERIAL, SERIATE, SERIATIM : see under Series.

SERICEOUS, a. *sĕ-rĭsh'ŭs* [L. *sērĭcus*, silken—from *Sērēs*, a people of eastern Asia, the Chinese] : in *bot.*, covered with fine close-pressed hairs ; silky.

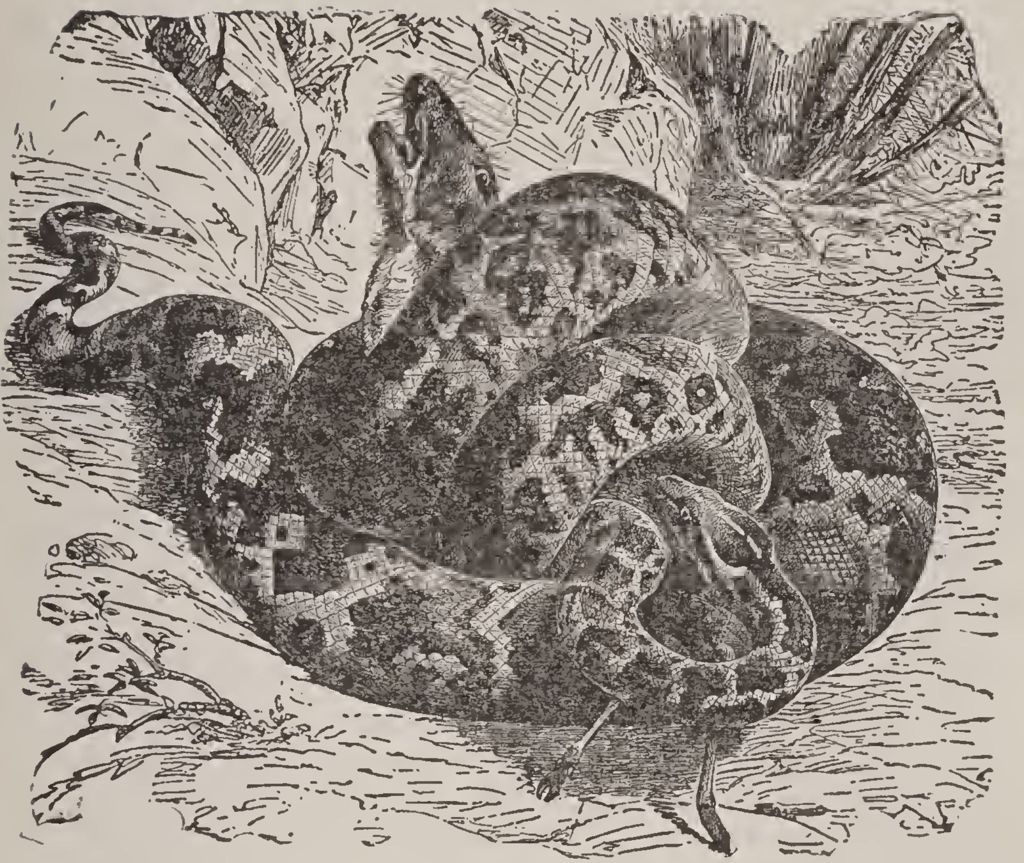
SERICIN, n. *sĕr'ĭ-sĭn* [L. *sērĭcum*, silk] : in *chem.*, a name proposed for the fibroin of silk to distinguish it from the organic matter of the sponge, for which the name fibroin would be retained.

SERICULTURE, n. *sĕr'ĭ-kŭl-tūr* or *-chûr* [L. *sērĭcum*, silk; *Sērēs*, an old name of the Chinese—as silk first came from the East; L. *cultūra*, culture]: the breeding and treatment of silk-worms.

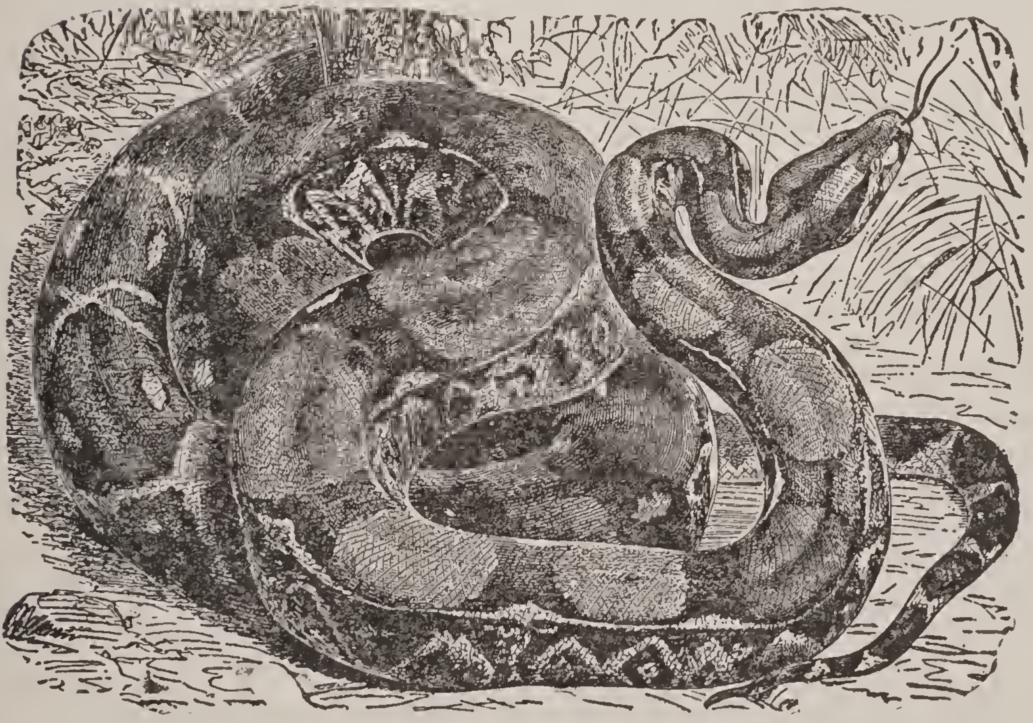
SERIE'MA, or Saria'ma: see Cariama.

SERIES, n. *sē'rēz* [L. *serĭēs*, a succession, a series—from *serĕrĕ*, to join or bind together: It. *serie:* F. *série*]: a succession of things in the same order, and having the same mutual relation; course; train: in *arith.* or *alg.*, a number of terms in succession, increasing or diminishing according to a certain law (see Series, Mathematical). Se'rial, n. *-rĭ-ăl*, some light subject or subjects commenced and continued in successive numbers of a periodical work; a work appearing in a series or succession of parts; a periodical: Adj. consisting of a series. Se'rially, ad. *-lĭ*, in

PLATE 5.



Python.



Boa Constrictor.

a series or regular order. SE'RIATE, a. *-āt*, arranged in or pertaining to a series. SE'RIATELY, ad. *-lĭ*, in a regular series. SE'RIA'TIM, ad. *-ā'tĭm* [L.]: in regular order.

SE'RIES, CHEMICAL: group of compounds each of which contains the same radical. Thus the hydrocarbon Methane, CH_4, may take up any number of molecules of the radical CH_2, giving rise to C_2H_6 (Ethane), C_3H_8 (Propane), C_4H_{10} (Quartane), C_5H_{12} (Pentane), etc.: see HOMOLOGY: BOILING OF LIQUIDS.

SE'RIES, MATHEMATICAL: see ARITHMETICAL PROGRESSION: GEOMETRICAL PROGRESSION: PROGRESSION.

SERINAGUR, *sĕr-ĭ-na-gėr'*, or SIRINUGGUR, *sēr-ĭ-nŭg-gėr'*, or CASHMERE, *kăsh-mēr'*, or KASHMIR: city, capital of the Vale of Cashmere (q.v.); on both sides of the Jhelum, here 100 yards wide; 170 m. n.n.e. of Lahore. It is quaint and picturesque-looking almost beyond conception. The streets, or rather narrow lanes, lead to the river, and the houses, five and six stories high, are built of wood. Not one straight line is to be seen. The houses overhang the river, and lean toward each other above the lanes or the canals, in various stages of dilapidation. Communication between the two quarters is kept up by means of a number of rustic wooden bridges, built on enormous piles of timber or stone. Shawls are an important article of manufacture (see CASHMERE—valley). Manufacture of articles of papier-maché, whose designs are far in advance of the workmanship, and engraving on stone and metal, are important industries. The vicinity of the city, with its border of towering mountains, is exceedingly beautiful. The numerous lakes, connected with the town and river by canals, recall Venice to the traveller. The most notable public structures are the Jumna Musjid or 'Great Mosque,' capable, according to native estimate, of containing 60,000 persons, the mosque of Shah Hamedan, a royal tomb, and the governor's residence. Near the e. end of the city lies the Dal or Lake of Serinagur, about 5 m. long and 2½ broad. It is a lovely and tranquil sheet of water, formerly a choice retreat of the Mogul emperors, the remains of whose pleasure-grounds and palaces are still visible on its margin, the most celebrated being the Shalimar, of polished black marble.—Pop. (1873) estimated 132,000, of whom nearly 40,000 were Hindus: in the early part of the 19th c. it is stated to have been 150,000 to 200,000.—*Captain Knight's Diary of a Pedestrian in Cashmere and Tibet* Pop. (1891) 120,340; (1901) 122,618.

SERINGAPATAM, *sĕr-ĭng-ga-pa-tăm'* (properly, *Shri Ranga Patanam*, City of Vishnu): decayed city of s. India, former cap. of Maisur or Mysore (q.v.), on an island in the channel of the Kaveri, nine m. n.n.e. of Maisur. The island, three m. long and one broad, has a wretched appearance, and the town itself is ill built, ill ventilated, and ugly. The fort, about three-quarters of a mile broad, is surrounded by strong walls of stone, and contains the palace of Tippoo Sahib (q.v.). Hyder Ali (q.v.) made it the seat of his govt. 1765. It was besieged by Lord Cornwallis 1791 and 92. On the last occasion, the terms dictated by the commander of the British to Tippoo, son and successor of Hyder Ali, were very severe. A British army appeared before the walls again 1799; and May 3 the fort was stormed, and Tippoo slain near his palace. Pop.—said to have been 300,000—(1800) 31,895; (1881) 11,734.

SERIO-, prefix, *sē'rĭ-ō:* having a mixture of serious interest; partly serious.

SERIO-COMIC, a. *sē'rĭ-ō-kŏm'ĭk,* or Se'rio-com'ical, a. *-ĭ-kăl* [from Eng. *serious,* and *comic:* L. *sērĭō,* in earnest]: combining the serious and sportive.

SERIOUS, a. *sē'rĭ-ŭs* [mid. L. *seriōsus*—from L. *serĭus,* grave, earnest: It. *serioso:* F. *sérieux*]: grave in manner or disposition; deeply impressed with the importance of religion; not light or gay; being in earnest; weighty; not trifling. Se'riously, ad. *-lĭ,* solemnly; in earnest. Se'riousness, n. *-nĕs,* the condition or quality of being serious; gravity of manner or of mind; solemnity; earnest attention.—Syn. of 'serious': grave; solemn; important; weighty; earnest; religious.

SERJEANT: see Sergeant.

SER'JEANT-AT-ARMS: see Sergeant-at-arms.

SER'JEANT-AT-LAW, or Sergeant-at-law: formerly the highest degree of barrister in the common law of England, called serjeant-counter, or of the coif. The degree is of great antiquity; and a barrister could be appointed only after being of 16 years' standing. Formerly, also, these officers had exclusive audience in the court of common pleas. No appointments have been made since 1868, and the order was nearly extinct 1883. Their proper forensic dress was a violet-colored robe with a scarlet hood. The degree was entirely honorary, and merely gave precedence over barristers; forming a separate community. Sometimes one or more of the serjeants-at-law have been appointed queen's serjeants.

SERMON, n. *sĕr'mŏn* [F. *sermon*—from L. *sermo* or *sermōnem,* a speaking, discourse: It. *sermone*]: a discourse delivered by a clergyman or licentiate from a pulpit, generally on a text selected from Scripture; a homily; any serious exhortation. Ser'monize, v. *-īz,* to inculcate rigid rules; to preach. Ser'monizing, imp. Ser'monized, pp. *-īzd.*

SEROLIN, n. *sĕr'ō-lĭn* [L. *sĕrum,* whey; *ŏlĕum,* oil]: a peculiar fatty matter found in the blood.

SERON, n. *sĕ-rŏn',* or Seroon, n. *sĕ-rôn'* [F. *serron,* a box containing foreign drugs: Sp. *seron,* a hamper]: in *commerce,* a bale or package made of hide or leather, or formed of pieces of wood covered or fastened with hide, for holding drugs, etc.; also Ceroon.

SEROTINE, n. *sĕr'ō-tĭn* [F. *sérotine*—from L. *serōtĭnus*, that comes late—from *sēro*, late]: a species of bat.

SEROTINOUS, a. *sĕ-rŏt'ĭ-nŭs* [L. *serōtĭnus*, happening late—from *sēro*, late]: in *bot.*, applied to a plant which flowers later in the year than others to which it is related.

SEROUS, a. *sē'rŭs* [F. *séreux;* It. *seroso*, serous—from L. *sĕrum*, whey]: watery; thin; like whey; pertaining to serum. SEROSITY, n. *sĕ-rŏs'ĭ-tĭ*, in *med.*, the watery part of serum when coagulated by heat. SERUM, n. *sē'rŭm* [L.]: the thin watery substance like whey which separates from the blood when coagulated (see BLOOD).

SE'ROUS FLU'IDS: term applied by chemists and physicians to various fluids in the animal body, arranged by Gorup-Besanez, one of the highest authorities on physiological chemistry, under three heads: 1. Those contained in the serous sacs of the body, e.g., cerebro-spinal fluid, pericardial fluid, peritoneal fluid, pleural fluid, fluid of the tunica vaginalis testis, and synovial fluid. 2. The tears and the fluids in the eyeball, the amniotic fluid, and transudations into the tissue of organs. 3. Morbid or excessive transudations, e.g., dropsical fluids, the fluids occurring in hydatids, and in blebs and vesicles on the skin, and transudations from the blood in the intestinal capillaries, as in cases of intestinal catarrh, cholera, or dysentery.

All these fluids closely resemble one another in their physical and chemical characters. So far as relates to their physical characters, they are usually clear and transparent, colorless or slightly yellow, of slight saline, mawkish taste, and exhibiting alkaline reaction with test-paper. They possess no special formal or histological elements, but microscopic examination occasionally shows blood-corpuscles, cells of various kinds, molecular granules, and epithelium in them. The ordinary chemical constituents of S. F. are water, fibrin (occasionally), albumen, the fats, animal soaps, cholesterin, extractive matters, urea (occasionally), the same inorganic salts which are found in the serum of the blood, and the same gases as in the blood. Rare constituents, and occurring only in disease, are sugar, the biliary acids, salts of lactic and succinic acids, creatinine, mucin, etc. The following analyses of four of the S. F. will give a good idea of their composition:

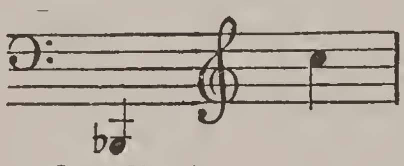
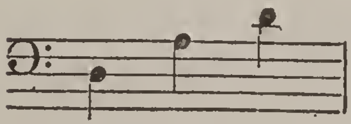
	Plasma of the Blood.	Peritoneal Dropsy.	Hydrothorax.	Dysenteric Transudation
Water, . . .	901·51	946·0	936·0	958·6
Solid Constituents,	98·49	54·0	64·0	41·4
Fibrin, . . .	8·06		0·6	
Albumen, . .	81·92	33·0	52·8	15·0
Extractive Matters,		13·0	3·0	14·6
Inorganic Salts, .	8·51	8·0	7·4	11·8

SE'ROUS MEM'BRANES: in anatomy, seven membranous bags—all, except one, closed bags—having their inner surfaces moistened with serum. Three of the S. M. in the human body are median and single, while two are double and lateral. They are the arachnoid, the pericardium, and the peritoneum, with the two pleuræ and tunicæ vaginales testis. Thus they are connected, with the obvious view of facilitating motion and affording general protection, with all the most important organs in the body. Each sac or continuous membrane consists of two portions—a parietal one which lines the walls of the cavity, and a visceral or reflected one which forms an almost complete coating or investment for the viscera contained in the cavity (see PERICARDIUM: PERITONEUM: PLEURÆ). The interior of the sac is filled during life with a halitus or vapor, which after death condenses into a serous fluid. In structure, they consist essentially of (1) Epithelium; (2) Basement Membrane; (3) A stratum of areolar or cellular tissue, which constitutes the chief thickness of the membrane, and on which mainly its physical properties are dependent. This layer is more liable to variation than the others, and one of the most common alterations is an augmentation of the yellow fibrous element, by which an increased elasticity is given to the membrane, which is thus better adapted for distention, and for subsequent return to its original bulk. The situations in which this augmentation is found are pointed out in exact conformity with this view: in the peritoneum, which lines the anterior abdominal wall, and covers the bladder, it attains its maximum; in the detached folds of the mesentery, in the costal pleuræ, and in the suspensory ligament of the liver, it is still very prominent; while on the posterior wall of the belly, and in serous membranes covering the heart, liver, etc , it is almost absent.

The following are the most important morbid changes to which the S. M. are liable. One of the most frequent is an excess of serous fluid in their cavity. This condition occurs in deaths from various diseases; and in general the serous membrane only shares in a dropsy common to other structures, and affecting especially the areolar or cellular tissue. When general anasarca, or dropsy of the cellular tissue, has long existed, more or less dropsical effusion is usually found in the pleuræ and peritoneum. Concerning inflammation of these structures, see PERICARDITIS: PERITONITIS: PLEURISY. Tubercle is seldom primarily deposited in these membranes, though it is not uncommon after other organs have been implicated. Cancer and ossification of the S. M. are rare, but cysts of various kinds, some of parasitic origin, are often found.

Synovial Membranes (q.v.) present many points of similarity to serous membranes, but with several points of difference.

SERPENT, n. *sėr'pĕnt* [F. *serpent*—from L. *serpens* or *serpen'tem*, a serpent—from *serpo*, I creep: It. *serpente*]: reptile having a very long body without feet, and which moves by undulations and contractions (see SERPENTS: SERPENT-CHARMING): a subtle or malicious person: musical instrument twisted somewhat like a serpent (see below). SERPENT-LIKE, a. acting like a serpent. SERPENT-FISH, a fish of a red color resembling a snake. SERPENT-STONES, SERPENT'S-TONGUE, popular names of certain fossil shells or teeth, the latter also the plant *adder's-tongue*. SER'PENTA'RIA, n. *-pĕn-tā'rĭ-ă*, or SER'PENTARY, n. *-tėr-ĭ* [F. *serpentaire*, dragon-wort—from L. *serpentārĭa*]: the Virginian plant *snake-root*—the *Polyg'ăla sen'ĕga*, ord. *Polyg'ălācĕæ;* also the *Aristolōchĭa serpentārĭa*, ord. *Aris'tolochĭācĕæ;* name applied to many plants (see ARISTOLOCHIA). SER'PENTA'RIUS, n. *-rĭ-ŭs*, a northern constellation. SER'PENTRY, n. *-trĭ*, a winding or twisting like that of a serpent. SERPENTIFORM, n. *sėr-pĕn'tĭ-fawrm* [L. *forma*, shape]: serpent-shaped.

SER'PENT: powerful bass musical wind-instrument, consisting of a tube of wood covered with leather, furnished with a mouthpiece like a trombone, ventages, and keys, and twisted into serpentine form, whence its name. Its compass is said to be from B♭ below the bass staff to C in the third space of the treble clef, including every tone and semitone—  ; but the highest octave does not sound well with ordinary players. When unskilfully played, it exhibits the most startling inequalities of tone, in consequence of there being three notes  much more powerful than the rest. The S. is in B♭; therefore music for it must be written a whole tone above the real sounds. It was invented by a French priest at Auxerre 1590, and though its principal use has been in military music, it has been employed also in the orchestra to reinforce the basses. As an orchestral and even as a military instrument, the S. is far less manageable than the Ophicleide (q.v.), which has nearly superseded it. It is still much used in the music of the Rom. Cath. Church.

SERPENT-CHARMING: art practiced in Egypt and throughout the East from remote antiquity. In India, and partly if not entirely in other countries, the profession of this art is hereditary. There are several allusions to serpent-charming in the Old Test.: see Ps. lviii. 4, 5; Eccles. x. 11; Jer. viii. 17. It is mentioned also by some ancient classics, as Pliny and Lucan.

Serpent-charmers usually ascribe their power over serpents to some constitutional peculiarity, and represent themselves as perfectly safe from injury even if bitten by them. To confirm this, they are accustomed, in their exhibitions, to exasperate the serpents, and allow themselves to be bitten, so that blood flows freely. But it has been fully ascertained that the serpents which they carry with them, and produce on these occasions, though of the most venomous kinds, have been at least deprived of their poison-fangs; and to prevent new ones from growing, a portion of the maxillary bone is often if not always taken out; in some cases, it appears that the poison-glands themselves are removed by excision and cautery. So much, however, being set aside as of the nature of a juggler's trick, much remains which is interesting, in which there is unquestionable reality. The serpent-charmers of the East have a power beyond other men of knowing when a serpent is concealed anywhere, long practice having probably enabled them to distinguish the musky smell which serpents generally emit, even when it is too faint to attract the attention of others. They are therefore sometimes employed to remove serpents from gardens and the vicinity of houses. In this, as in their exhibitions, they pretend to use spells. What power the tones of their voice may exert, is uncertain; but they accompany their words with whistling, and make use also of various musical instruments, the sound of which certainly has great power over serpents. When the serpents issue from their holes, the serpent-charmer fearlessly catches them, by pinning them to the ground by means of a forked stick. But one of the first things that he then does is to knock out or extract the poison-fangs.

In the exhibitions of serpent-charmers, the creatures are often made to twine round the bodies of the performers. They also erect themselves partially from the ground, and in this posture they perform strange movements to the sound of a pipe, on which the serpent-charmer plays. It appears also that he exerts a very remarkable influence over them by his eye, for even before any musical sound has been employed, he governs and commands them by merely fixing his gaze upon them.

SERPENTIGENOUS, a. *sėr'pĕn-tĭj'ĕ-nŭs* [L. *serpentĭg'ĕna*, one who is sprung from a serpent—from *serpens* or *serpen'tem*, a serpent; *gigno*, I beget]: bred of a serpent.

SERPENTINE, a. *sėr'pĕn-tīn* [F. *serpentin*, serpentine —from L. *serpens* or *serpen'tem*, a serpent]: resembling a serpent in motion; winding; meandering; spiral; twisted; subtle: N. [F. *serpentine*]: a mineral, chiefly hydrated silicate of magnesia (see below). Ser'pentinely, ad. *-lĭ*.

SERPENTINE, *sėr'pĕn-tīn:* mineral composed of silica and magnesia in almost equal proportions, with about 13–15 per cent. of water, and a little protoxide of iron; named from the serpent-like form which its veins often assume. S. is generally massive, very rarely crystallized in rectangular prisms. Common S. occurs sometimes as a rock. It is unctuous to the touch, and soft enough to be scratched by calcareous spar; it is not easily broken, but can be cut without much difficulty, and is turned into ornaments of various kinds. It is generally green, black, or red; the color sometimes uniform, sometimes spotted, clouded, or veined. PRECIOUS S., or NOBLE S., is of rich dark-green color, hard enough to receive good polish, translucent; and sometimes contains imbedded garnets, which form red spots, and add to its beauty. It is a rare mineral, occurring in veins and masses of S. in many Amer. localities, as at Newbury, Mass., etc.; and at Baireuth in Germany, in Corsica, at Portsoy in Banffshire, in the Shetland Islands, etc. It is found generally with foliated limestone, in beds under gneiss, mica-slate, etc., or in Common S. The ancient Romans used it for pillars and for many ornamental purposes; and vases, boxes, etc.. are still made of it, and much prized. The ancients ascribed to it imaginary medicinal virtues.

S. belongs to the metamorphic rocks, and is generally associated with the granitoid, igneous, or metamorphic rocks, though it is occasionally found as a member of the trappean series. Trap-dikes passing through or coming into contact with limestone frequently convert it into S., or fill it with lines or masses of serpentine.

SERPENTINIANS, *sĕr-pĕn-tĭn'ĭ-anz:* heretical sect in the 2d c.: see OPHITES.

SER'PENTS (*Ophidia*): order of reptiles, in general simply characterized as having a very elongated body and no external limbs. The links, however, which unite saurians with S. are very numerous; the limbs of many saurians being partially lacking, and little more than rudimentary; while rudimentary limbs are found by anatomical examination in many S., and the rudimentary hinder limbs of some, as boas, appear externally in the form of hooks or claws: see BOA.

The body and tail are covered with scales, the head often with plates. The vertebræ and ribs are extremely numerous, a pair of ribs being attached to each vertebra throughout the length of the body: some S. have more than 300 pair of ribs. The ribs not only give form to the body, and aid in respiration, but are also organs of locomotion. There is no breast-bone (*sternum*) for the small end of the ribs to be attached to, as in other vertebrate animals, but each rib is joined by a slender cartilage and a set of short muscles to one of the scales of the abdomen. A serpent moves by means of the ribs and of these scales, which take hold on the surface over which it passes: and in this way it can glide—often very rapidly—along the ground, or on the branches of trees; and many species climb trees with great facility, gliding up them as if on level ground. Most—if not all—of the species are also capable of elevating a great portion of the body from the ground; and many of those which live among branches of trees hold their place firmly by means even of a few scales near the tail, and freely extend the greater portion of the body in the air. On a perfectly smooth surface, as that of glass, a serpent is quite helpless, and has no power of locomotion. The vertebræ are so formed as to admit of great pliancy of the body, which is capable of being coiled up, with the head in the centre of the coil; and some S. have the power of throwing themselves to some distance from this coiled position. The vertebræ are articulated by perfect ball-and-socket joints, the anterior extremity of each being rounded into a smooth and polished ball, which fits exactly into a hemispherical cup in the next; but there are processes in each vertebra which prevent any motion except from side to side, so that S. are incapable of the vertical undulations so often represented in prints. The ribs are also attached to the vertebræ by ball-and-socket joints.

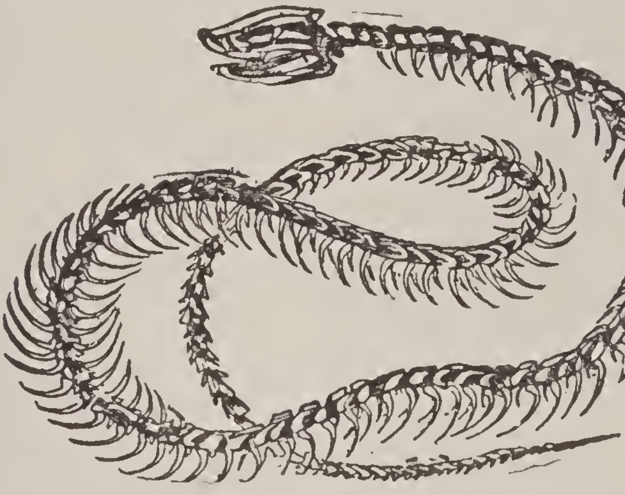


Fig. 1.—Skeleton of the Rattlesnake.

Cuvier divided S. into three sections, the first—of which the common Blind-worm (q.v.) or Slow-worm is an example, but now classed with lizards—consisting of those which have the skull, teeth, and tongue similar to those of saurians, and in which the eye has three lids, and there are vestiges of bones of anterior limbs; the second, which Cuvier calls True S., having no vestiges of such bones, the eye destitute of lids, and the bones of the head so formed that the mouth and throat are capable of very great dilation; the third, which he calls Naked S., containing only the genus *Cœcilia* (q.v.), now known, notwithstanding its form, to belong really to the Batrachians or Amphibia.

The S. of Cuvier's first section have been conjoined with some of the nearly allied saurians, more or less furnished with external limbs, under the name *Saurophidia*, by Gray. They are connected with the True S. by the families *Amphisbœnidœ* and *Typhlopsidœ*, which nearly agree with them in structure of the head and mouth, but lack the third eyelid—some of the *Typhlopsidœ*, indeed, having the eye itself merely rudimentary—and, like the True S., have no vestige of breastbone or shoulder. These, with all the creatures included in this section, are, so far as is known, perfectly harmless. They live chiefly on insects and other very small animals.

The True S. live on larger prey, which they swallow entire, some of them—as the boas—crushing it by constriction in the coil of their muscular body. The prey of a serpent is often thicker than the serpent itself; and to admit of its being swallowed, the throat and body are very dilatable. The bones of the head are adapted to the necessity of great expansion of the mouth and dilation of the throat, as will be seen by the annexed figure of the distended jaws of the rattlesnake. The bones composing the upper jaw are loosely joined together by ligaments; and even the arches of the palate are movable. The two halves of the lower jaw are connected by a ligament, so loose and elastic that they are capable of separation to a great extent; and the mastoid and tympanic bones, which connect the lower jaw and the skull, are lengthened out into pedicles, allowing extraordinary dilation. S., however, sometimes seize prey too big for them to swallow, and die in the attempt, their teeth being so formed as to render it difficult to reject by the mouth what has once entered the throat. The teeth of the True S. are simple, and directed backward. In the non-venomous kinds there are four rows on the upper part of the mouth—two rows on the jaws, and two on the palate; each division of the lower jaw also is armed with a single row. In vipers, rattlesnakes, and other venomous S. there are no teeth on the upper jaw, except the poison-fangs; the palatal teeth, however, forming two rows as in the non-venomous kinds, the arrangement of teeth in the lower jaw being also the same. Venomous S. do not, in fact, need the same array of teeth as the non-venomous; depending rather on the power of their venom for their prey, which they suddenly wound, and then wait till it is dead. The poison-fangs are long in comparison with the other teeth; they are two in number, firmly fixed into a movable bone; when not in use, they are laid flat on the roof of the mouth, covered by a kind of sheath formed by the mucous membrane of the palate; when the animal is irritated, and about to assail its enemy or its prey, they stand out like two lancets from the upper jaw: they move with the bone into which they are fixed; and the bone and muscles are so arranged that the opening of the mouth brings them into position for use. There is above them, and toward the back of the head, a large gland for elaboration of the poison, which is forced through them by the action of the muscles each fang being tubular. The tube of the fang is formed not as by a hollowing of it, but as by a bending of it upon itself, and is situated in front: the opening near the fang's point is a narrow longitudinal fissure. The poison-fangs are very liable to be destroyed, and the germs of new ones are generally found behind them, ready to grow and supply

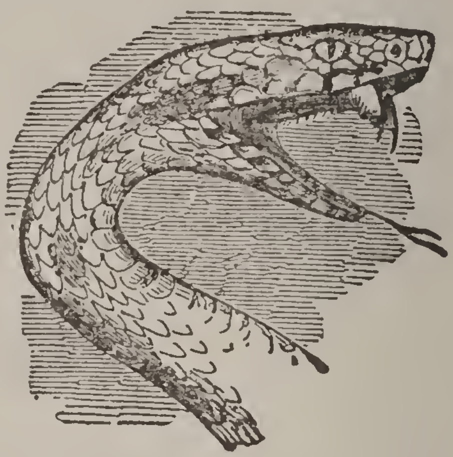


Fig. 2.

their place. It is sometimes stated as a distinction between venomous and non-venomous S., that the former have only two rows of teeth on the upper part of the mouth, while the latter have four. This rule must not, however, be accepted without qualification. In the marine S. (*Hydridæ*) there are rows of maxillary teeth behind the poison fangs; and some of the venomous land-S., as the Bongars or Rock Snakes of the E. Indies, which, however, are not among the most venomous, have some smaller teeth in the jaw-bones behind the poison-fangs.

The venom differs very much in its deadly power in different species. The bite of some causes the death of a human being in a few minutes, so that no creatures are more formidable; that of others proves fatal after the lapse of hours; while the bite of others, e.g., the common viper, is seldon fatal, though causing great pain and many unpleasant consequences. 'I have carefully examined all the evidence on record,' says Mr. Buckland, 'as regards the most efficacious internal remedy that can be given in such cases, and have come to the conclusion that nothing is so good as ammonia' (*Curiosities of Natural History*). The same writer also recommends brandy or other stimulating drinks in large quantities. But it is of utmost importance to suck the wound as soon as possible after it has been inflicted; and no danger is to be apprehended in doing so, if there be no scratch or sore about the mouth, for the poison, so deadly when it mixes with the blood, is quite innocuous when taken into the stomach. Many antidotes to the poison are in vogue in different countries, most if not all, utterly unworthy of regard. Dr. Fayrer believes that the bite of the cobra, elaps, and Russell's viper is almost certain death. *Tight* ligatures above the bitten part, to stop the circulation of the poisoned blood; excision; cauterizing with live coal, red-hot iron, or gunpowder; application of ammonia, and repeated doses of alcohol, are the chief remedies to be tried; but they must be resorted to *immediately* after the patient has been bitten.—See VENOMOUS BITES AND STINGS.

For the peculiarities of the lungs of S., see REPTILES. The heart is placed very far back in the body. The intestines have great absorbent power, and the feces consist only of the most indigestible portions of the prey in an extremely desiccated state; the members of the animal which has been swallowed being still often distinguishable, and hair, scales, and the like, remaining unchanged.

The tongue of S. is forked, and is often thrust out of the mouth. It is vulgarly regarded as the *sting*, but S. have no sting, the only weapons being the fangs already noticed. The only sound which they emit is hissing: the rattle of the rattlesnake is caused by motion of the tail.

S. are either strictly oviparous or they are ovoviviparous. The non-venomous are generally oviparous; the venomous, ovoviviparous. The eggs of those which lay eggs are generally deposited in a long string, connected by a kind of viscous substance, in some heap of decaying vegetable matter, the mother paying no further heed to them. But some coil themselves around their eggs and hatch them; and it seems that the habits of even the same species differ as to this, in different climates. The eggs are not quite devoid of calcareous covering, but have so little that their integument is soft and pliable.

It has been often alleged that vipers and other S., when alarmed, swallow their young, and eject them again after reaching a place of safety. There still remains some doubt on this curious question, which has been much discussed; and it is probable that the alleged proofs of it from living young ones issuing out of the body of the parent when crushed are to be accounted for by the ovoviviparous mode of generation.

It seems probable that S. do not possess the senses of taste or smell in great perfection. The ear has no external opening and no tympanum, nor is it certain that their hearing is acute, but they are remarkably sensible of the power of music, of which serpent-charmers avail themselves, both to bring them from their holes and to control them: see SERPENT-CHARMING. A European gentleman, residing in one of the mountainous parts of India, found that his flute attracted them in such numbers to his house that he was under the necessity of ceasing to play it. Their eyes are small, and are protected from the dangers to which they might otherwise be exposed by a transparent integument connected with the skin, and which comes away with the skin when the old skin is cast off, as is the case at least once a year.

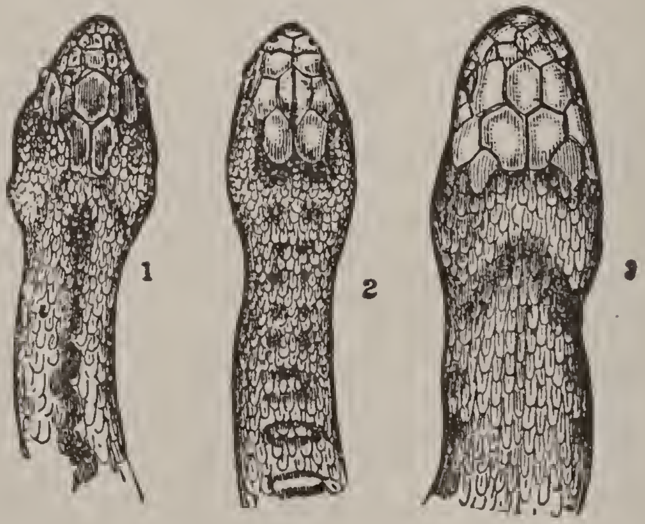


Fig. 3:
1, Viper; 2, Coronella lævis; 3, Common Snake.

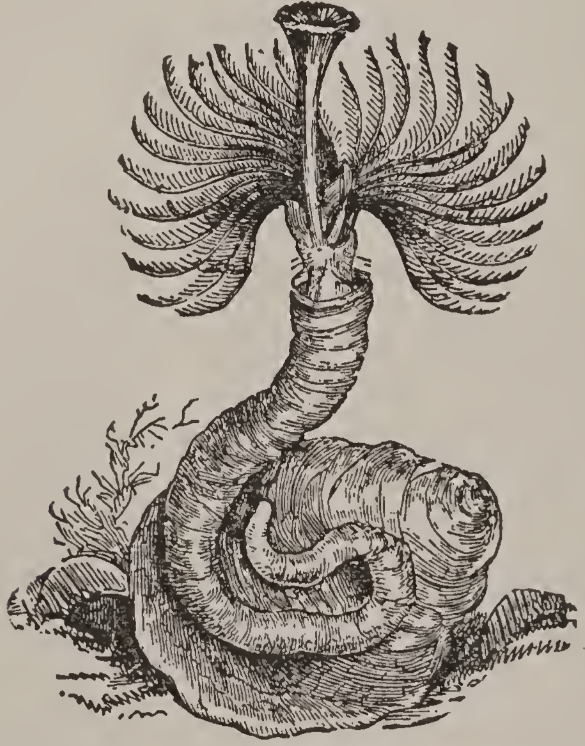
The colors of S. are very various, and often very beautiful. As a general rule, but not without exceptions, the venomous species are of darker and more uniform color than the non-venomous. The aversion and horror with which S. are so generally regarded are due to the dangerous character of so many of them, and the difficulty of observing and avoiding them. They are used as food by some savage tribes. They are capable of being tamed, and some of the non-venomous species have frequently been so, and have been found useful in killing mice, rats, and other such vermin. They abound chiefly in tropical climates, though some are found in northern countries, as in Scandinavia.—See Snake.—See Huxley's *Comparative Anatomy of Vertebrated Animals;* Cassell's *Nat. History;* Fayrer's *Thanatophidia of India;* and Brit. Museum *Catalogue of Snakes.*

SERPENT-WORSHIP, or Ophiolatry, *ŏf-ĭ-ŏl'a-trĭ:* nearly universal form of idolatry, of pre-historic origin. It prevailed especially among the Hamitic races, and was most developed in Egypt, where the serpent was a symbol of both the evil and the good principle. The evil red serpent Set, or Typhon, caused the death of the good divinity Osiris, who was sometimes represented as a falcon-headed serpent, and has been thought to personify the solar god Chneph. The asp symbolized the goddess Ranno, 'protector of houses, gardens, and the infancy of a royal child.' The goddesses Bai and Hoh, or Hih, also were represented by snakes, wholly or in part. The Chaldeans worshipped Bel in the form of a serpent or dragon. The Phœnicians had a similar feature of worship, and represented the cosmic egg as enfolded by a serpent. The evil Ahriman of the Persians had an ophiolatrous emblem. In the old Asiatic religions generally, the serpent was evil, and was worshipped to avert evil. In its proper form, or as a dragon, it abounds in Chinese mythology, to Long, the winged dragon, was attributed great intelligence, and to one of these monsters was ascribed the gift of rain. The Hindus rested the world on a serpent, probably as emblematic of some divine attribute, like the eternity of which the serpent is a Brahminic symbol. The Eden prophecy seems paralleled in the crushing of a serpent by Krishna, as also by the crushing of the python by Apollo and of the hydra by Hercules. Krishna's saving a herd of cattle from the corrupting breath of the monster accords with many legends that seem but to personify the miasma of marshes and that around fountains in some places. The Roman story that links a worshipped serpent with deliverance from an epidemic is the reverse of this. The shedding of skin, as if renewing youth, is thought to have connected serpents with health, longevity, hence wisdom, and to explain the serpent-wreathed staff of Mercury and the symbol of Æsculapius. Among the northern nations, there is the Norse legend of the snake at the root of the world-supporting tree Yggdrasil. In the southern United States and Hayti are remnants of the African snake-worship or superstitions. Some of the North Amer. Indians hold the reptile in high veneration—the Mohicans calling the rattlesnake their grandfather, and the Moquis holding a 16 days' snake-dance—a notable one beginning 1891, Aug. For the Gnostic sect of serpent-worshippers, see Ophites. Among many books on the general subject are Deane's *The Worship of the Serpent,* etc. (1833), and Fergusson's *Tree and Serpent Worship* (1869).

SERPIGO, n. *sér-pī'gō* [L. *serpĕrĕ*, to creep]: in *med.*, ringworm or tetter, so called from its creeping over the surface of the skin. SERPIG'INOUS, a. *-pĭj'ĭ-nŭs*, affected with serpigo.

SERPUKOV, *sĕr-pô-ċhov'*, or SERPUKHOFF, *sĕr-pô-khof':* very ancient Russian town, 61 m. s. of Moscow, on high cliffs, on the banks of the Nara, 3 m. above its confluence with the Oka. It contains a cathedral, and is defended by a Kreml, or citadel. There are more than 50 factories, of which those engaged in manufacture of cotton prints, sail-cloth, woolen goods, and leather are of importance. Pop. (1884) 22,420.

SERPULA, n. *sér'pū-lă*, SER'PULÆ, n. plu. *-pū-lē* [L. *serpŭla*, a little serpent—from *serpĕrĕ*, to creep]: genus of annelids, of the order *Tubicolæ;* named from the tortuous and twisted tubes which they form and inhabit. The tube is calcareous, like that of mollusks, and was therefore described in old works on conchology. Indeed, the shell of a S. is not always easily distinguished from that of mollusks of the genus *Vermetus*, though the inhabitants are extremely different; but the shell of *Vermetus* has a regular spire at the apex, not found in that of any serpula. The serpulæ attach their shells to rocks, shells, etc., in the sea. The shell is variously contorted, and some species live in groups, with the shells intertwined. The wider end of the shell is open, and from it the animal protrudes its head and gills which expand as beautiful fan-like tufts. They are in general exquisitely colored, and are among the most interesting and beautiful creatures for an aquarium. On the slightest alarm, they disappear completely into the tube, which then is closed by an operculum curiously framed as an appendage to the gills



Serpula contortuplicata, on the Back of an Oyster-shell.

The species are numerous in all parts of the world; but the largest are found in tropical seas, and are among the lovely objects visible through clear, still water on coral reefs. SERPULIDÆ, n. plu. *sėr-pū'lĭ-dē,* or SERPU'LIDANS, n. plu. *-dănz.* animals of the genus Serpula. SERPULITES, n. plu. *sėr'pū-līts* [L. *serpŭla,* a little serpent; Gr. *lithos,* a stone]: in *geol.,* the general term for all fossil tortuous tubes and tube-like organisms, apparently allied to those of the existing Serpulæ, and possibly the products of tube-forming annelids.

SERRANO Y DOMINGUEZ, *sĕr-râ'no ē tho-mēn'gĕth,* FRANCISCO, Duke de la Torre: marshal of Spain: 1810, Sep. 17—1885, Nov. 26; b. Arjouilla, Andalusia; son of Gen. Serrano y Cuenca. When 16 years of age he entered the army; he was rapidly promoted, and was made a gen. 1840. He was largely instrumental in the overthrow of Espartero 1843; was promoted lieut.gen. 1845, and soon afterward entered the senate and was appointed minister of war. He had great influence over Queen Isabella, and 1846 caused a bitter quarrel in the royal household, which resulted in the overthrow of the ministry. He became a liberal and joined his former enemies; was banished 1854 for his connection with an insurrection at Saragossa; but soon returned and was appointed capt.gen. of New Castile; was ambassador to Paris 1857; was capt.gen. of Cuba 1860, and for his services there was made 1864 a grandee and given the title Duke de la Torre. He was pres. of the senate 1866; joined in the revolution 1868, and became commander-in-chief of the army; was regent of Spain 1869, June 16—1870, Nov. 16; became pres. of the republic 1874, Feb. 27; but the following Dec., on learning of the movement to proclaim Alfonso king, he retired to France. In 1875 he was again in the senate of Spain, and 1883 became minister to France. He died at Paris.

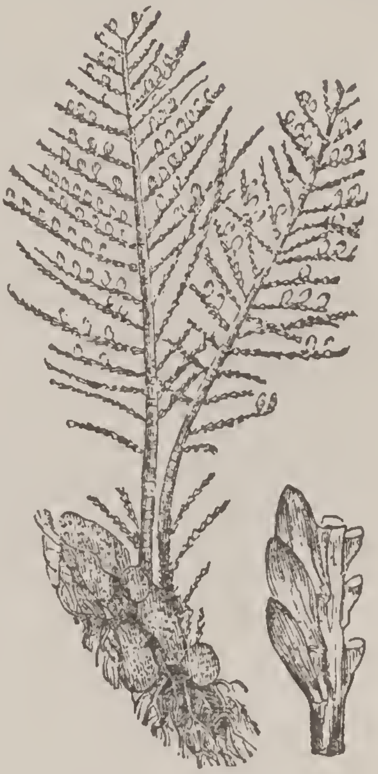
SERRATE, a *sĕr'rāt,* or SER'RATED, a *-ĕd* [L. *serrātus,* saw-shaped—from *serra,* a saw]: in *bot.,* notched on the edge like a saw, as a leaf: where the teeth are themselves serrate, the term used is BI-SERRATE, which see SERRATION, n. *sĕr-rā'shŭn,* notching resembling a saw. SERRATURE, n. *sĕr'ră-tūr,* a saw-like notching on the edge of anything. SER'RULATE, a *-rū-lāt,* or SER'RULATED, a. *-ĕd* [L. *ser'rŭla,* a little saw]: in *bot.,* the same as SERRATE; having very minute notches; having very fine serratures. SER'RULA'TION, n. *-lā'shŭn,* the state of being notched minutely like the teeth of a fine saw.

SERRAVALLE, *sĕr-râ-vâl'lā:* city of n. Italy, in Venetia, on the river Aleschio, in a valley, 35 m. n. of Venice. It was formerly fortified. The cathedral S. Andrea is very ancient. Pop. 5,400.

SERRE-FILE, n. *sėr-fīl′* [F. *serre-file*, a bringer-up—from *serrer*, to tighten—from L. *sera*, a bolt; F. *file*, a file—from L. *filum*, a thread]: in *mil.*, a bringer-up—a squadron or troop *serre-file* being an officer or non-commissioned officer in rear of the centre of the squadron or troop.

SERRIED, a. *sĕr′rĭd* [F. *serré*, closely pressed; *serrer*, to shut in, to press—from mid. L. *serārĕ*, to lock—from L. *sera*, a bolt]: crowded; compacted.

SERTORIUS, *ser-tō′rĭ-ŭs*, Quintus: one of the ablest Roman commanders in the later ages of the republic: b. in Nursia, in the country of the Sabines; d. B.C. 72. He began his military career in Gaul; fought B.C. 105 in the disastrous battle on the Rhone in which the Roman proconsul, Q. Servilius Cæpio, was defeated by the Cimbri and Teutones; and took part in the splendid victory at Aquæ Sextiæ (mod. Aix), B.C. 102, where Marius discomfited the same barbarians. On the breaking out of the sanguinary struggle between the party of the nobles under Sulla (q.v.) and the popular party headed by Marius (q.v.), B.C. 88, he espoused the cause of Marius. Morally he was much superior to the military adventurers of his time; and the impression given of him in Plutarch's picturesque biography is that of a valiant, resolute, honest, and stubborn Roman, of a character more frequent in the 3d than in the 5th c. of the republic. None of the Marian generals held out so long or so successfully as he against the victorious oligarchy. He fought in conjunction with Cinna the battle at the Colline Gate, which placed Rome at the mercy of the Marians; but he had no hand in the bloody massacres that followed; instead, he gathered his own troops and slew 4,000 of the ruffianly slaves whom Marius was permitting to plunder and ravish at will through the city. On the return of Sulla from the East, B.C. 83, S. withdrew into Etruria; but finding it impossible to act in concert with the other military leaders of his party, he went to Spain, where he continued the struggle in an independent fashion, at first with so little success that he found it advisable to embark for Mauritania. Returning to the Peninsula, at the invitation of the Lusitanians, he gathered an army of natives, Libyans and Romans, and after a time became the virtual monarch of the whole country. During B C. 80–76 he was victorious over all his opponents; nor was it until the arrival (B.C. 76) of young Pompey ('Pompey the Great') that he found an opponent worthy to cope with him; and even Pompey was scarcely yet his equal in military skill. S. drove Pompey over the Iberus (Ebro) with heavy loss, and the campaign of the following year was of the same kind; for though S.'s subordinates were twice beaten, Pompey himself had no success, and was forced to write urgent letters to the senate for reinforcements. The campaigns of the next two years show the gradual operation of that miserable jealousy that wrought the ruin of S. Perperna, and other Roman officers of the Marian party, who had fled to him B.C. 77, when Sulla became triumphant at home, and who seem to have been a set of base adventurers, secretly stirred up the Spaniards against him; and when that artifice did not prove successful, they conspired against his life, and assassinated him in his tent under circumstances of shameful perfidy. With S. the Marian or popular cause sank, until it was revived and attained final success in the person of Julius Cæsar (q.v.). Plutarch wrote S.'s life, and Corneille made it the subject of a tragedy.

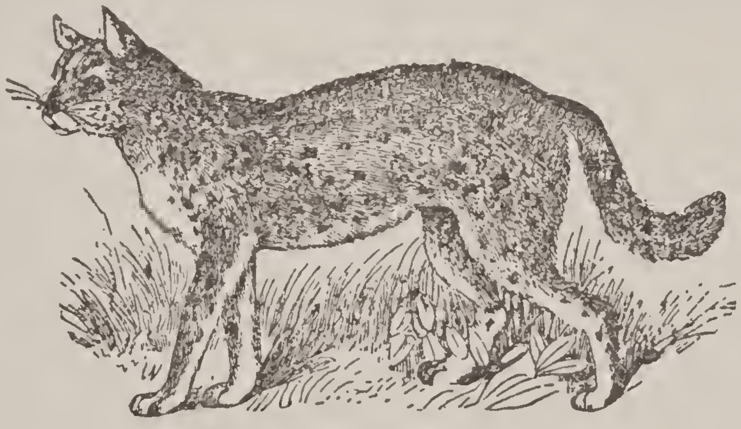


Sertularia Ingra, with a portion magnified.

SERTULARIA, n. *sėr'tū-lā'-rĭ-ă* [L. *sertum*, a wreath of flowers—from *serĕrĕ*, to plait]: genus of campanularian hydroids, in which the branched horny investment of the plant-like colony forms a cup around each polyp. The polyps are arranged in double row, and the colony is attached to stones, shells, sea-weeds, etc. See HYDRA: MEDUSA.

SERUM: see SEROUS: BLOOD.

SERVAL, *sėr'val* (*Felis Serval* or *Leopardus Serval*): one of the smaller *Felidæ*, native of s. Africa; the *Boschkatte*, or Bush-cat, of the Cape Colony. It is about two ft. in length, exclusive of the tail. The S. is one of the mildest and most docile of the *Felidæ*—a beautiful animal, yellowish with black spots, the lower parts white with black spots. The fur is in great request, and is known to furriers as that of the *Tiger Cat.*



Serval (*Felis Serval*).

SERVE, v. *sėrv* [F. *servir*, to serve—from L. *servīrĕ*, to be in service—from *servus*, a servant or slave: It. *servo*, a servant]: to work for; to perform duties, as an officer in the army or navy; to assist; to attend at command; to yield obedience to; to supply with anything; to suffice for; to stand in place of something else; to officiate or minister, as a clergyman; to be a servant or slave; to be subordinate to anything; to treat or requite, generally in an ill sense; to worship God; to present a writ; to attend or wait; to accomplish an end; to suit or be convenient; to manage, as cannon. SER'VING, imp.: N. among *seamen*, the process of covering large ropes or cables with canvas or spun yarn to prevent friction or wearing in parts much exposed. SERVED, pp. *sėrvd.* SERVER, n. *sėr'vėr*, one who serves; a salver. SER'VANT, n. *-vănt*, a person employed by another for labor and to be at his command (see MASTER AND SERVANT): V. in *OE.*, to reduce to the condition of a servant. To SERVE IN, to belong to and do duty in, as in the army or navy. To SERVE ONE OUT, to retaliate upon; to requite. To SERVE ONE'S SELF, to act as one's own servant; to take or use without help; to avail one's self of. To SERVE OUT, to distribute in portions; to punish; to retaliate. To SERVE UP, to place on the table, as dressed food. To SERVE A WRIT OR SUMMONS, to read it to the defendant, or, more usually, to leave an attested copy at his residence. To SERVE A WARRANT, to show or read it to the person against whom it is issued, and to seize his person. To SERVE AN EXECUTION, to seize or take possession of lands, goods, or person, according as the law requires in the case. To SERVE A ROPE, to roll something round it to prevent its injury from friction. To SERVE AN OFFICE, to discharge the duties of a public office. TIME-SERVER, one who regulates his actions by the requirements of the times instead of by duty; one who meanly complies. A SERVANT OF SERVANTS, one debased to the lowest condition of servitude. YOUR HUMBLE SERVANT, YOUR OBEDIENT SERVANT, etc., conventional phrases of civility at the close of a letter. SERVANT GIRL OR MAID, OR SERVING-MAID, a female servant. SERVANT-MAN, OR SERVING-MAN, a male servant.—SYN. of 'serve, v.': to minister to; obey; promote; aid; assist; help; succor; benefit; wait; attend; be sufficient; answer; work for; supply; satisfy; content; treat; requite; worship; present; discharge; conduce.

SERVETUS, *sėr-vē'tŭs*, MICHAEL, or, in his native Spanish, MIGUEL SERVEDE: notable and unfortunate speculator in theology: 1511–1553, Oct. 27; b. Tudela, in Navarre; son of a notary of good family in Aragon. [This is according to his Vienne deposition: in Geneva he gives his birthplace as 'Villeneufve.'] At the age of 1 he quitted Spain, and commenced the study of law a Toulouse, which he soon abandoned to apply himself with ardor to the knotty points of the Reformation doctrines. In 1530 he went to Basel to hear Œcolampadius, and thence to Strasburg, where Bucer and Capito taught. His daring denial of the doctrine of the Trinity frightened or angered these divines to such a degree that they denounced him as 'a wicked and cursed Spaniard.' S. appealed from their judgment to that of the public in his *De Trinitatis Erroribus Lib. VII.* (Haguenau 1531; modern edition, Nürnberg 1791), and his *Dialogues* (Haguenau 1532), but the public thought as little of his teaching as the theologians; and to avoid the odium which it had occasioned; he changed his name to Michael de Villanueva, and fled to Paris, where he studied medicine under Sylvius and

Fernel, and took his degree as a physician with honors. S. seems to have possessed a penetrating though rash and restless intellect, which enabled him to *hit* truth occasionally in his flighty researches, or, at least, to make happy guesses in the right direction: e.g., he had an idea (see Flourens in *Journal des Savants*, 1854, Apr.) of the doctrine of the circulation of the blood. He attacked Galen and the faculty with his customary violence in a treatise on Syrups (*Syruporum Universa Ratio*, Paris 1537, Lyon 1546). About this time he opened a correspondence with Calvin, from whom at last he asked a safeguard for a visit to Geneva. Calvin, profoundly indignant both at S.'s views and at his mode of advocating them, refused, and writing to Favel, 1546, Feb. 13, said: 'If ever he enters the city, he shall not leave it living, if I can prevent it.' After living successively at Lyon, Charlieu, and Avignon, supporting himself by writing for the booksellers, he found an asylum in the palace of Pierre Paulmier, Abp. of Vienne, 1541, where—apparently in full conformity to the Rom. Cath. Church—S. remained some years: where also he wrote his famous *Christianismi Restitutio*, pub. 1553. The work has been twice reprinted, first by Dr. Meade of London (incomplete), and again by Murr, Nürnberg 1790. Its celebrity is due more to the fact that it sealed the fate of its author, than to its intrinsic merits, the ideas being obscure and the style incorrect. The authorship was traced to S. by means partly of samples of S.'s handwriting which were sent by Calvin. S. was imprisoned at Vienne, but escaped (1553, Apr. 7), and set out for Naples; but he seems to have tarried nearly a month at Geneva, and being recognized, Aug. 13, was imprisoned on a formal accusation against him by Calvin (q.v.). [Another account relates his arrest on the day of his arrival.] After a long and complicated judicial procedure, S. was condemned to be burned, though Calvin would have had him beheaded; and the sentence was carried into execution the next day.

S. showed some traits of genius, with much rashness of thought and great self-confidence in argument and reasoning, due partly perhaps to the fact that he was utterly without scientific training in theology—having been self-taught. Both his character and his career are a puzzle. His writings give an impression of sincerity. No law then in force at Geneva has ever been adduced authorizing the sentence of death, or any penalty in such a case except banishment.—The fate of S., after all conceivable palliations are weighed, remains a black stain on the memory of Calvin.—See Willis's *S. and Calvin* (London 1877): also a valuable collection of opinions on the case, in *De Hæreticis, aut sint persequendi . . . Sententiæ* (Magdeburg 1554).

SERVIA, *sėr′vĭ-a* (*Srbija*): proclaimed a kingdom 1882, Mar. 6; but a principality tributary to Turkey till 1878, when the Berlin Conference recognized its independence. It is part of the Balkan Peninsula (q.v.): its frontiers touch those of Austria, Roumania, Bulgaria, and Turkey; 18,630 sq. m.; pop. (1900, Dec. 31) 2,493,770; (of present area, 4,000 sq. m. were added 1878, and of the pop. more than 300,000). The country is mountainous and densely wooded. From the interior, numerous chains proceed northward, forming massive barriers on the e. and w. frontiers, and sloping steeply toward the swampy plains along the Save and the Danube. In the extreme n.e., near Orsova, they reach the very edge of the Danube, and with the Eastern Carpathians, on the opposite shore, imprison the great river within a wall of rock, known as the *Iron Gate* of the Danube. The highest of these chains is the Rudnik Mts. (gathered into a knotty group about the centre of the state), which in the Great Schturaz rises 3,400 ft. The *Schumadia,* or Forest, extends s. from Belgrade for 60 m. Beautiful landscapes are everywhere. The principal rivers (Servian *Rjeka*) flowing through the country are the Morava and Timok, affluents of the Danube, and the Kolubara, affluent of the Save, which itself falls into the Danube at Belgrade. The climate is temperate and salubrious, but somewhat cold in the higher regions. The soil in the valleys and level districts is fertile, and equally fitted for the rearing of cattle, the favorite occupation of the people, and for production of corn and wine; but not more than $\frac{1}{6}$ of the land is under tillage; the remainder is forest or wilderness. Oak is the most common wood, but chestnuts and fruit-trees of all sorts abound, especially pears, of which there are whole forests in some places. The mountains are believed to be rich in copper and silver, but mining is almost unknown, and manufacturing industry is very backward.

Constitution, etc.—In 1882 Prince Milan was proclaimed the first king of S. His troubles with Nathalie, his queen, culminated in his obtaining a separation from her 1888, and subsequently an absolute divorce. In 1889 Milan abdicated the throne in favor of his son, Alexander I. (b. 1876); 1890 the divorce was declared not binding; and 1891 Nathalie was forcibly expelled from the kingdom. Its constitution dates from 1869. The legislative power resides partly in the king, partly in the *Skupshtina* or national assembly of 178 members. There are eight ministers. The council of state or senate is a deliberative, not legislative, body, and has the duty of draughting the laws to be submitted to the Skupshtina. This council comprises one member for each of the 22 districts into which S. has been divided since its enlargement 1878. There is also a great assembly of 558 members, which is called when required to decide vital and constitutional questions. All tax-paying citizens are electors.—The army has since 1883 been remodelled and extended: 1889, Jan. 31, milit. service was made compulsory and universal.

The country is div. into 5 dists., and the militia was reorganized into 75 battalions of active army and reserve (total 84,000 men), and 120 battalions of ter. militia (total 73,500 men), giving a force of 157,500 men. The total war strength (1903) was 300,000 men.

Religion, Education and Finance.—The inhabitants nearly all belong to the Greek Church (Est.), but are independent of the Patriarch of Constantinople. The tl. of R. Cath., Prot.,and Jews (1895 was less than 19,000. Ecclesiastical affairs are managed by a metropolitan, whose seat is at Belgrade, and by the three bishops of Uzitza, Shabatz, and Timok. For the few who ack. the authority of the pope and the Latin Church, there is a bishop *in partibus infidelium,* but who resides at Diacobar in Austrian Slavonia. S., according to recent estimates, had 624 churches, 52 monasteries, and 1,000 priests, besides 63 monks. It also possessed (1899) two normal schools, with 214 pupils, besides several gymnasia, a lyceum for philosophical and juristic studies, a theological college, an artillery school, a school of agriculture, and 1,000 elementary schools with 160,900 pupils. Education is making rapid progress. In 1902 the revenue was $14,564,000; expenditure within revenue; imports $8,800,085; exports $13,017,130; public debt $83,737,018. There were 350 m. of railroad and 2,350 m. of telegraph with 3,470 m. of wire.

Character.—The Servians are distinguished for vigor of frame, personal valor, love of freedom, and glowing poetical spirit. Their manners and mode of life are exceedingly picturesque, and strongly prepossess a stranger in their favor. They rank among the most gifted and promising members of the Slavic family.

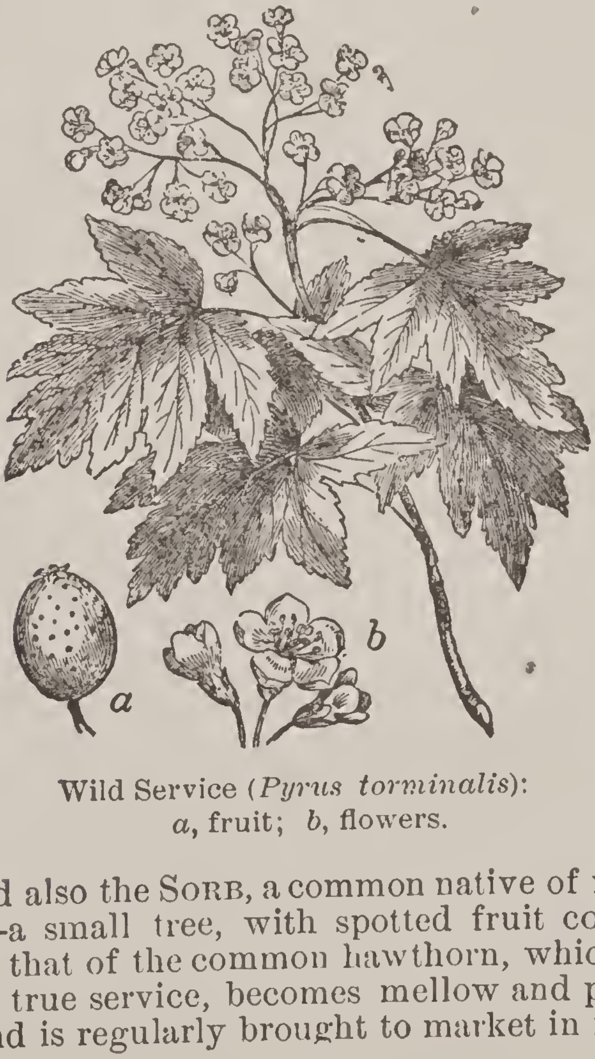
History.—In the earliest times of which we have record, S. was inhabited by Thracian or Illyrian races—the Bessi, Scordisci, Dardanii, and Triballi. Shortly before the time of Christ, it was subjugated by the Romans, and under the name *Mœsia Superior* formed part of the province of Illyricum, whose fortunes it shared during the vicissitudes of the empire. Overrun successively by the Huns, Ostrogoths, Longobards, etc., it reverted to the Byzantine rulers about the middle of the 6th c., but was wrested from them by the Avars in the 7th c., to oppose whom Emperor Heraclius, about 636, invoked the aid of the Serbs from eastern Galicia. The Serbs obeyed the call, and in less than two years drove the Avars from the land, over which they themselves spread in great numbers, their settlements extending from the Morava as far w. as the Dalmatian Alps and the Adriatic, and from the Save as far s. as the Balkan and Lake Scutari. About the middle of the 9th c., they were converted to Christianity by missionaries sent by Emperor Basilius; but this did not abate their natural ardor for battle, and for nearly 200 years they were almost constantly at war with the neighboring Bulgarians—the inveterate enemies of their Byzantine liege lord. In 1043, however, Stephen Bogislav expelled the imperial governors; and 1050–80 his son, Michael, made himself wholly independent, took the title king of S., and procured the recognition of his royal dignity from Pope Gregory VII. For the next hundred years the Serbs had to fight hard to maintain their independence, but the struggle terminated in their favor; and 1165 Stephen Nemanja founded a dynasty which lasted two centuries, during which period the kingdom of S. attained the acme of its power and prosperity. Under Stephen Dushan (1336–56), the greatest monarch of the Nemanja dynasty, it comprised the whole of Macedonia, Albania, Thessaly, n. Greece, and Bulgaria. The progress of the Turkish arms, however, was fatal to its welfare, and 1389 King Lazar fell in the disastrous battle at Kossovopolje. Sultan Bajazet divided the country between Lazar's son, Stephen, and Lazar's son-in-law, Vuk Brankovitch, but compelled both to pay tribute and to follow him in war. Gradually the Serbs sank more and more under the Turkish yoke, until 1459 S. was thoroughly subjugated by Sultan Mahmud. It was uniformly the theatre of the bloody wars between Hungary and Turkey, and frequently suffered the uttermost horrors of devastation. Prince Eugene's brilliant successes for a moment flashed a ray of hope into the miserable hearts of the long-suffering Serbs, and by the treaty of Passarowitz (1718) a considerable portion of the country was made over to Austria; but 1739 it reverted to Turkey, and for the next 60 years the cruelty and oppressions of the pashas and their janizaries surpass belief. At length the unhappy people could endure the tyranny of their foreign masters no longer, and 1801 an insurrection broke out, headed by George Czerny (q.v.), which, by the help of Russia, ended in the triumph of the patriots, and in the election of Czerny by the people as Prince of Servia. The invasion of Russia by France, however, left the Serbs at the mercy of their late rulers, and the war again broke out; Czerny was forced to flee, and the tyranny of the Turks became more ferocious than ever. Again the people flew to arms under the leadership of Milosch Obrenovitch, and a second time won back their liberties. Milosch was chosen Prince of Servia 1815. Compelled to abdicate 1839, he was 1858 restored to his former dignity, which was made hereditary in his family. 1876, July, S., excited by the rebellion in Herzegovina, declared war against Turkey, and was joined by Montenegro. The Servians, generally unsuccessful, in spite of the help of numerous Russian volunteers, were totally defeated at Alexinatz in Sep.; in Nov. an armistice was concluded; and 1877, Mar., the conditions of peace were signed. Next month war was declared by Russia against Turkey. The sympathies of the principality were undoubted; but Servia did not venture again to take the field against Turkey till the fate of the war had been practically decided by the fall of Plevna 1877, Dec. The recognition of Servia's independence, and an important increase of its territory to the southward, were agreed to by the Berlin Congress 1878. For the shameful and inglorious war of 1885, see BULGARIA. In 1893 Prince Alexander came of age and took the throne, but his arbitrary methods, especially his annument of the acts of the Assembly, made him unpopular. In 1903 a conspiracy, fomented by the army, led to his assissination, and Peter Karageorgevitch ascended the throne as Peter I.

Language and Literature.—The Servian language, called also the Illyrian, belongs to one of the four great divisions of the Slavic family, and is more nearly allied to Russian than to Polish or Bohemian. It is distinguished from the other members of its division by the predominance of vowels, and consequently by its soft, melodious resonance. This character it owes in part to the influence of the Italian and Greek languages—the former influence being the result of commercial intercourse; the latter, of community of religious belief. The long domination of the Turks has also left unmistakable traces on the Servian tongue; nevertheless, it has preserved a Slavic character, possessing a complete system of declension and conjugation, and a free syntax.

After their conversion to Christianity, the Serbs, like the Russians, employed the old Slavic church-language in writing, but in two different styles, one called the church style, the other the chancery or legal style. The most important monument of the latter is the 'Law-book,' published by King Stephen Dushan, though the oldest extant specimens date back as far as the 11th c. The literary remains of the former are more numerous, and embrace ecclesiastical, devotional, and historical works, composed mostly by the clergy and the monks. With George Brankovitch (1645–1711), who wrote a *History of Servia* from the origin of the nation to his own time, this first or mediæval period in Servian literature closes. The second or modern period is characterized in its commencement by an effort to raise the spoken language of the Serbs to the dignity of a written language. The consequence was, that for a considerable time the literary language of S. was a chaos of confusion, writers not appearing able to make up their minds which dialect to use, and spoiling their productions by a barbarous mixture of both; and it was not till Vuk Stephanovitch published his *Grammar of the Servian Language* (1814), and his *Songs of the Servian People*, that the victory of the reformers was complete. Since then, the spoken language of S. has become the language also of literature. These Servian popular songs or ballads constitute by far the finest part of Servian literature. The picturesque scenery of the land, and the free solitary life of the mountain ranges, kindled the imagination of the people, and awoke the voice of song at an early period. Some of the ballads—now widely known throughout Christendom by translations—go back to a period anterior to the appearance of the Turks in Europe. In a wonderful manner, they combine the rude strength, spirit, and naïveté characteristic of the ballad everywhere with oriental fire and Greek plasticity. They are invariably unrhymed, but preserve at the same time a rhythmic measure. See Kapper's *Volkslieder der Serbien* (2 vols. Leip. 1852); and Bowring's *Servian Popular Poetry* (Lond. 1827), and Owen Meredith's (i.e., Earl Lytton's) *Serbske Pesme* (Lond. 1861). Of modern vernacular poets the greatest is Branko Raditchevitch (1824–53), creator of modern Servian literature—the Servian Burns, as he has been called. Others are, Abp. Muschicki (died 1837), Milutinovitch (died 1848), Jovanovitch, Jakchitch, Ilitch, Rakitch. Georgevitch, Niegosch, Kengelaz, Rajitch, and Milutinovitch have written history. Science has made little progress. In another branch of the Servian people—the so-called Illyrians, especially the Dalmatians, who profess the Rom. Cath. faith—literature received an earlier and more artistic development than among the Serbs of the Greek Church. In the 12th c., a priest of Ducla (Dioclea) wrote a Chronicle, first in Slavic, afterward in Latin, fragments of which are extant. During the 13th and 14th c., devotional works in the vernacular were numerous, and toward the end of the 15th c. the republic of Ragusa (Slav. Dubrovnik) obtained the name 'Illyrian Athens' for the brilliant success with which it cultivated literature, art, and science. Epic, lyric, and dramatic poetry, history, and jurisprudence, are admirably represented. The list of poets is particularly large. Toward the end of the 18th c., literary activity abated among the southern or Illyrian Serbs, but began to increase in the north, especially in Croatia and Hungary.—See Ristitz, *Ueber die Serb. Literatur* (Berl. 1853), and, in English, Talvi's *Historical View of the Languages and Literature of the Slavic Nations* (New York 1850); also Schafarik's *Geschichte der Südslawischen Literatur* (1864), and Novakovitz's *Istorija srpske Knijzevnosti* (Belgrade 1867). There are numerous grammars and dictionaries.

SERVICE, n. *sėr′vĭs* [F. *service*—from L. *servĭtĭum*, the condition of a slave or servant—from *servus*, a slave or servant: It. *servizio*]: labor, physical or mental, performed in course of duty, or for the benefit of another; the place or business of a servant; profession of respect uttered or sent; obedience; religious rites or worship; public worship; the obedience due to God; in *Chh. of Eng.*, the music to which the Te Deum and Canticles are set; employment; use; purpose; advantage; official duties of a clergyman: employment in the army or navy under govt.: a benefit conferred; favor; a course, as of dishes at table; a collection of vessels used at table; among *seamen*, the layers of spun yarn fastened round a rope to protect it from friction. SER′VICEABLE, a. *-ă-bl*, useful; beneficial; capable of duty. SER′VICEABLY, ad. *-ă-blĭ*. SER′VICEABLENESS, n. *-bl-nés*, the state or quality of being serviceable. SERVICE AND WORK, name often given to an action brought by one who has done work to order, or on request, or has been engaged for a specific time. SERVICE-BOOK, a prayer-book or missal. SERVICE-PIPE, a pipe connecting mains with a dwelling, as the gas or water-pipes. ACTIVE SERVICE, engaged in actual warfare, or in duties connected therewith. CIVIL SERVICE, see that title. FOREIGN SERVICE, military service outside the territory regarded as the home-land of a nation, as opposed to *home service.*—SYN. of 'service': utility; avail; usefulness; office; attendance; place; obedience; submission; employment; business; use; purpose; advantage.

SERVICE, or SERVICE-TREE, n. *sĕr'vĭs* [L. *sorbus*, the service-tree]: one of several trees allied to the apple and pear trees; the *Pyrus sorbus* or *P. domes'tĭca*, ord. *Rosācĕæ*, akin to the mountain-ash (see PYRUS); the *Sorbus domesticus* of many botanists. It is a tree 50 or 60 ft. high, with pinnated leaves, which are downy beneath, and their leaflets serrated upward, and small white flowers in panicles; found in various parts of Europe, w. Asia, and n. Africa; and cultivated for its fruit, which is obovate, and about an inch in length, resembling a small pear, but pleasant only in a doughy and overripened state, like the medlar. It is more cultivated in Italy, Germany, and France, than in Britain. The tree is of very slow growth, and attains great age. The timber is valuable, very heavy, fine-grained, and susceptible of high polish, possessing a strength and durability which particularly adapt it for some purposes of the machine-maker. It is used also for making mathematical rulers, etc.—The name WILD SERVICE is given to an allied species, *Pyrus torminalis*, called also the SORB, a common native of middle and s. Europe—a small tree, with spotted fruit considerably larger than that of the common hawthorn, which, like the fruit of the true service, becomes mellow and pleasant by keeping, and is regularly brought to market in many parts



Wild Service (*Pyrus torminalis*):
a, fruit; *b*, flowers.

of Europe. The dried fruit is used in some places as a cure for diarrhea. The wood is highly valued: it is hard and tough, yellowish-white, with brownish-red and dark-brown streaks.—See JUNE-BERRY: SHAD-BUSH.

SERVIETTE, n. *sėr-vĭ-ĕt'* [F.]: a table-napkin.

SERVILE, a. *sėr'vīl* or *-vĭl* [F. *servile*—from L. *servīlĭs*, slavish, servile—from *servus*, a slave or servant; It. *servile*]: pertaining to a servant or slave, or characteristic of one; dependent; cringing; mean; fawning; meanly obsequious: in *gram.*, not belonging to the original root, as a *servile* letter; also said of a letter not sounded, or silent. SER'VILELY, ad. *-lĭ.* SER'VILENESS, n. *-nĕs*, or SERVILITY, n. *sėr-vĭl'ĭ-tĭ*, the condition of a slave or bondman; mean submission; slavish deference; obsequiousness.

SERVITE, n. *sėr'vīt* [It. *servitore*, a servant]: in *chh. hist.*, the name commonly given to a monastic order, the Religious Servants of the Holy Virgin, founded 1233 by seven Florentine merchants at Mt. Senario, near Florence. In 1487 Pope Innocent VIII. bestowed on the Servites the privileges of the four great mendicant orders. The life is one of austerity and continual prayer; and the rule is a modification of that of St. Augustine. Since the French Revolution many houses have been founded in different countries.

SERVITOR, n. *sėr'vĭ-tėr* [F. *serviteur*, a servant—from mid. L. *servitor*—from L. *servus*, a slave or servant]: a follower or adherent; an attendant; an Oxford undergraduate partly supported by the college funds. SER'VITORSHIP, n. office or position of a servitor. SER'VITUDE, n. *-tūd* [F.—L.]: the condition of a servant or slave; slavish dependence; bondage: in *Scotch law*, term borrowed from the Roman law to denote that kind of right or interest which a person may have in land of which he is not owner—e.g., right of passage, pasture, aqueduct, etc.; also Life Estate (q.v.). PENAL SERVITUDE: see under PENAL.

SER'VIUS TUL'LIUS: see ROME.

SERVUS SERVORUM DEI, *sėr'vŭs sėr-vō'rŭm dē'ī* [Lat. Servant of the Servants of God]: form of subscription adopted by the Roman pontiffs from the days of Pope Gregory the Great, by whom, according to his biographer, Paul the Deacon, it was assumed as a practical rebuke of the ambitious assumption of the title of 'Ecumenical (or universal) Patriarch,' by John, surnamed Nesteutes, or the Faster, the contemporary Patriarch of Constantinople. Gregory is said, indeed, by Paul to have been the first Christian bishop by whom this humble form was employed: but this is certainly a mistake, the same designation having been frequently used by bishops before the time of Gregory. Gregory was probably the first of the bishops of Rome to adopt it as a distinctive title. It is found in all the letters of Gregory which Venerable Bede has preserved in his History.

SESAME, n. *sĕs′ă-mē*, or Ses′amum [L. *sesămum;* Gr. *sēsămon*, an Eastern oily grain: It. *sesamo:* F. *sésame*]: genus of plants of nat. order *Bignoniaceæ*, sub-order *Pedaliaceæ*, a sub-order characterized by wingless seeds, and placentæ with woody lobes attached to the inner wall of the fruit. The calyx of S. is five-parted; the corolla bell-shaped and five-parted, the lowest lobe prolonged; the stamens four, two longer than the others, and a rudimentary fifth stamen; the capsule is oblong, almost four-celled, two-valved, many-seeded. The species are natives of India and Africa, and are annual plants, covered with hairs, their flowers solitary in the axils of the leaves, on very short stalks. They are so similar as to be sometimes reckoned mere varieties of one species, *S. Indicum.* The sweet oleaginous seeds are used in some countries, as in central Africa, for making a kind of hasty-pudding. In Egypt, they are eaten, strewed on cakes. The bland fixed oil of S. obtained from the seeds by expression, is used as food, and for medicinal purposes, like olive oil. It keeps long without becoming rancid. It is much used by the women of Egypt as a cosmetic. Chiefly for its oil, S. is much cultivated, as it has been from very ancient times, in India, China, Japan, and many tropical and subtropical countries. The oil cake, mixed with honey and preserved citron, is an oriental luxury. The leaves of S. abound in a gummy substance, which they readily impart to water, making a rich bland mucilage, used in the southern United States as a demulcent drink. S. is sometimes called *Tilseed.* Open sesame [from the well-known tale of Ali Baba and the Forty Thieves']: a talisman or specific in any form, used successfully to accomplish an object.

Sesamum orientale
(Sesame).

SES′AME GRASS: see Gama Grass.

SESAMOID, a. *sĕs′ă-moyd*, or Ses′amoid′al, a. *-ăl* [Gr. *sēsămon*, sesame; *eidos*, appearance]: shaped like a grain of sesame. Sesamoid bones, small bones in the substance of the tendons of muscles in the neighborhood of certain joints. In the human subject, the patella is the best example; and beside it, they are usual only on the palmar aspect of the joint which unites the metacarpal bone with the first phalanx, and in the corresponding position in the toe, there being two in each position, and their object being to increase the leverage of the short flexor muscles of the thumb and toe. They are much more abundant in the great majority of mammals than in man.

SESBA′NIA: see Dhunchee.

SESHA, *sā′sha:* in Hindu Mythology, the great king of the serpent race, on which Vishn′u reclines on the primeval waters. He has a thousand heads, which also serve as a canopy to Vishn′u; and he upholds the world, which rests on one of his heads. His crest is ornamented with jewels. Coiled up, S. is the emblem of eternity. He is often called *Vâsuki* or *Ananta*, the eternal.

SESOSTRIS, *sē-sŏs'trĭs:* Greek name of a celebrated Egyptian monarch, who, in what must be deemed the legends of the Greek historians, is related to have conquered all Asia and Ethiopia, indeed the whole known world. His name has passed into the series of those conquerors who have achieved universal empire. According to the Greek legendary history, when S. mounted the throne of Egypt, he began his scheme of conquest, first dividing Egypt itself into 36 nomes, placing his brother as regent, and laying on him injunctions not to assume the diadem, or interfere with the royal harem. S. then marched at the head of a large army, and invaded Libya, Arabia, Asia, penetrating further e. than Darius. Advancing through Asia Minor, he invaded Europe, and subdued Thrace and Scythia, leaving a colony at Colchis on his return. In the s. he subdued Ethiopia, and placing a fleet on the Red Sea, conquered the adjacent isles, and extended his dominions to India itself. On his return to Egypt from his northern campaigns, his brother, who had disobeyed his instructions, endeavored to destroy him, by inviting him to a banquet at Daphnæ, and treacherously attempting to burn him and his whole family by firing the house; but S. threw two of his children into the fire, and making a bridge of their burning bodies, escaped. S., in his triumphs, dragged his captives attached to the wheels of his chariot. The captives were employed on the public works, the enlargement of the Hephæsteum at Memphis (q.v.), and other temples, and in construction of canals and mounds. Memorials of his reign, it was said, were left as steles or tablets in the conquered countries; and Herodotus saw some in Palestine, which are supposed to be the tablets of Rameses II. (see RAMESES), still existing in the pass of Nahr-el-Kelb, or the Lycus, and the sculptured rock at Nymphi, near Smyrna. S. is said to have grown infirm and blind after a reign of 33 years, and to have ended his days by his own hand.

Utter confusion prevails as to identification of this monarch, among both modern and classical authors. Herodotus places his reign long before that of Cheops of the 4th dynasty. Dicæarchus makes him rule B.C. 3712, and is followed by Aristotle and other authors. Bunsen supposes more than one monarch of this name, and that one was Tosoithos, of the 3d dynasty; another Sesortesen II., of the 12th dynasty. Lepsius conjectures that S. is the Sethos I. and Rameses II. of the 19th dynasty. But the exploits of S. seem a conglomeration of the conquests of the kings of the 18th and 19th dynasties, especially the Thothmes and Rameses (q.v.), who extended the empire of Egypt far to the west and east. No one monarch of the Egyptian monarchy can represent Sesostris.—Herodotus, ii. c. 102; Diodorus, i.c. 55–57; Val. Flaccus, v. 419; Strabo, xvi.; Wilkinson *Mann. and Cust.* i. 99–106; ii. 70; iii. 190; Lepsius, *Einleit.* s. 278; Bunsen, *Aegyptens Stelie,* book ii. 85, 86, 312–324.

SESQUI, *sĕs'kwĭ* or *sĕs'kwī* [L. *sesqui*, more by a half]: a prefix in chemical terms which denotes that 1½ equivalents of one constituent is united to one equivalent of another, or in the proportion of three to two.

SESQUIALTER, a. *sĕs'kwĭ-ăl'tėr*, or SES'QUIAL'TERAL, a. *-ăl* [L. *sesquialter*, one and a half—from *sesqui*, more by a half; *alter*, other]: denoting the relation of 1½ to 1. SES'QUIAL'TERA, n. *-tėr-ă*, a compound stop on the organ, composed of five, four, three, or two ranks of open metal pipes, tuned in thirds, fifths, and octaves to the diapason. SESQUIALTERAL FLORET, in *bot.*, a perfect floret accompanied with a small abortive one.

SESQUICARBONATE, n. *sĕs'kwĭ-kâr'bō-nāt* [L. *sesqui*, more by a half, and Eng. *carbonate*]: a salt composed of 1½ equivalents of carbonic acid and 1 equivalent of any base, or in the proportion of three of the one and two of the other; also similarly of other salts.

SESQUIOXIDE, n. *sĕs'kwĭ-ŏks'īd* [L. *sesqui*, more by a half; Eng. *oxide*]: an oxide in which two atoms of a metal combine with three atoms of oxygen, as in the red rust of iron.

SESQUIPEDAL, a. *sĕs'kwĭ-pē'dăl*, or SES'QUIPEDA'LIAN, a. *-dā'lĭ-ăn* [L. *sesqui*, more by a half; *pedālis*, of or belonging to a foot—from *pes* or *pedem*, a foot]: containing a foot and a half; long-worded; using long words. SES'QUIPEDAL'ITY, n. *-dăl'ĭ-tĭ*, the practice of using long words.

SESQUIPLICATE, a. *sĕs-kwĭp'lĭ-kāt* [L. *sesqui*, more by a half, and Eng. *plicate*]: a term applied to the proportion one quantity or number has to another, in the ratio of one and a half to one.

SESQUITERTIAN, a. *sĕs'kwĭ-tėr'shan* [L. *sesqui*, more by a half; *tertĭānus*, belonging to the third—from *tertĭus*, third]: having the ratio of one and one-third to one, as between 8 and 6.

SESQUITONE, n. *sĕs'kwĭ-tōn* [L. *sesqui*, more by a half, and Eng. *tone*]: in *music*, an interval of three semitones.

SESSA, int. *sĕs'să* [L. *cessa*, leave off, have done]: in *OE.*, quiet; gently.

SES'SA: city of s. Italy, province of Caserta, about 38 m. n.n.w. of Naples. It has a fine cathedral, a theol. seminary and colleges. There are manufactories of woollen cloth. The neighboring soil is fertile S. is a very ancient city; it was the capital of the Aruncii, was afterward colonized by the Romans A.U.C. 314, and was very flourishing under the Roman empire. It was raised to a duchy in the middle ages. Pop. 7,000.

SESSILE, a. *sĕs'sĭl* [F. *sessile*, sitting—from L. *sessĭlĭs*, of or belonging to sitting—from *sedĕō*, I sit]: having a position as if sitting: in *bot.* and *zool.*, sitting directly upon the body to which it belongs, without a support; as a *sessile leaf*, which issues directly from the main stem or branch, without a footstalk.

Sessile Leaves.

Sessile Flower.

SESSION, n. *sĕsh'ŭn* [F. *session*—from L. *sessĭō* or *sessĭōnem*, a sitting—from *sedērĕ*, *sessum*, to sit. It. *sessione*]: a sitting; the actual sitting of a court, council, legislature, etc., for transaction of business; actual time during which they sit or meet, with only short adjournments: in *Eng.*, the period of time between the meeting of parliament and its prorogation: in *Scot.*, the lowest ecclesiastical court of a Presb. church. Session-clerk, in *Scot.*, one who officially keeps the books and documents of a session, makes all entries, and manages the proclamations of banns for marriages. Ses'sional, a *ăl*, pertaining to a session or sitting, particularly of an ecclesiastical court. Court of session (q.v.), in *Scot.*, the supreme civil court. Quarter sessions: see Quarter Sessions: Justice of the Peace.

SESSPOOL, n. *sĕs'pôl:* see Cesspool.

SESTALIT, *sĕs'ta-lĭt:* name given to a patent fuel consisting of small porous cubes, to be consumed in portable or small stationary stoves. It is used for heating small apartments, for keeping warm the feet of persons riding in a carriage in cold weather, etc. It emits no odor, no smoke. The material is set on fire by means of an alcohol flame.

SESTERCE, n. *sĕs'têrs*, or Sester'tius [F. *sesterce*—from L. *sester'tius*, a sesterce—from *semis*, a half; *tertius*, third; It *sesterzio*]: in *anc. Rome*, a silver coin, the fourth part of the *Denarius* (q v.); thus containing at first 2½ *asses* or *libræ*. The name S., abbreviation of the Latin *semis-tertius*, which was Roman mode of expressing 2½; the custom being to derive the names of all coins from the foundation of the money-system, the *As* (q.v.). The symbols for the S. were indifferently HS or IIS, the former only a modification of the latter, which expresses two units, and S. for the additional half-unit (*semis*). In the Latin classics. this coin is denoted often by *sestertius-nummus*, or merely *nummus*. When the *Denarius* (q.v.) was made to contain 16 *asses*, the relation between it and the S.

was preserved; and the S. from that time contained 4 *asses*, though the name, no longer significant, was preserved. Till the time of Augustus, when the relation of the denarius to the *as* was changed, the S. was worth about $4\frac{1}{10}$ cents; but after this period it was reduced to a little less than 3 cents.—The sum of 1,000 sestertii was called *sestertium* (after Augustus, = about $37.97), which was the 'money of account' (never a 'coin') used in the reckoning of large sums of money.

SESTET, SESTETTO: same as SEXTET, SEXTETTO.

SESTRI LEVANTE, *sĕs'trē lā-vân'tā:* seaport of n. Italy, 26 m. e.s.e. of Genoa; on a little bay near the mouth of the Gromolo. It has five foreign consulates. Its Church of the Nativity has valuable paintings. Pop. 2,300.

SESTRI PONENTE, *pō-nĕn'tā:* town of n. Italy, 4 m. w. of Genoa, on the high road along the sea-coast. There is a large govt. factory of tobacco. Pop. 9,500.

SET, a. *sĕt* [AS. *settan;* Dan. *sætte;* Ger. *setzen*, to place, to let down: Ger. *sitzen;* Icel. *sitia*, to sit: L. *sidĕrĕ*, to seat one's self; *sedērĕ*, to sit]: regular; formal; determined; obstinate; firm; established or fixed: N. a number or collection of things of the same kind, or of a similar form, intended to be used together; a number of things united in the formation of a whole; a complete assortment; a number of persons usually or officially united; a clique; a lot; a young plant for putting into the soil for growth; the descent of a heavenly body below the horizon: V. to put or place into any condition or state; to put, place, or fix; to assign; to predetermine; to cause to rest in a standing posture; to regulate or adjust, as a time-piece; to reduce a fracture; to adapt to music, as words; to spread, as sails; to fix in metal, as precious stones; to bring to a fine edge, as a razor; to mark game, as a dog; to sink below the horizon, as the sun; to be fixed; to change fluidity for firmness; to plant; to begin a journey—always with *out;* among *printers*, to arrange type in order; to compose. SET'TING, imp.: ADJ. falling below the horizon: N. the act of placing or fixing; the act of sinking or appearing to sink below the horizon; something inserted; that in which something, such as a precious stone, is set; the direction of a current, as of a sea or a wind; the hardening, as of cements, limes, or plasters; in *OE.*, an inclosure. SET, pt. and pp. SET'TER, n. *-tėr*, one who sets; an inciter, with *on;* a proclaimer; a sporting-dog that indicates by sitting or crouching the place where game lies hid (see below). TO SET ABOUT, to begin; to apply one's self. TO SET AGAINST, to place in opposition. TO SET AGOING, to cause to begin to move. TO SET APART, to separate to a particular use: to reserve. TO SET A SAW, to bend every alternate tooth to one side, and the remainder to the other. TO SET ASIDE, to reject for the present; to annul. TO SET AT DEFIANCE, to defy; to dare the power and malice of an adversary or enemy. TO SET AT EASE, to quiet; to tranquillize. TO SET AT NAUGHT, to despise; to undervalue. TO SET A TRAP, SNARE, OR GIN, to place it in a situation to catch prey; to concoct a design in order to draw into one's power. To SET BEFORE, to present to view; to offer. To SET BY, to place on one side for convenience or safety. To SET DOWN, to place upon the ground; to put in writing. To SET EYES ON, to see; to behold. To SET FORTH, to make appear; to manifest. To SET FORWARD, to begin to move on; to promote. To SET FREE, to release from confinement or bondage. To SET IN, to begin; to enter upon a particular state, as the weather. To SET IN ORDER, to adjust or arrange. To SET OFF, to decorate; to place against, as an equivalent; to start, as for a race; among *printers*, to deface or soil, as a recently printed sheet coming into contact with another not quite dry. To SET ON or UPON, to incite; to assault or attack; to fix or place. To SET ONE'S CAP AT or FOR, to endeavor to catch the attention or affections of—familiarly applied to a woman supposed to be making approaches in love to a man. To SET ONE'S SELF AGAINST, to place one's self determinedly in opposition to. To SET ON FIRE, to communicate fire to; to fill with disorder; to inflame the passions of. To SET ON FOOT, to put in motion; to start. To SET OUT, to begin a journey or course; to begin the world; to assign; to mark off; to adorn; to display; to state at large. To SET OVER, to appoint or constitute, as a superior, ruler, or commander. To SET RIGHT, to put in order; to correct. To SET SAIL, to begin a voyage. To SET VALUE ON, to esteem; to appreciate. To SET THE FASHION, to determine what shall be the fashion. To SET THE TEETH ON EDGE, to affect the teeth with a disagreeable sensation, as when an acid or a woolen cloth is brought into contact with them. To SET TO, to apply one's self; to affix. To SET UP, to found or establish; to raise; to exalt; to place on view; to utter loudly; to raise from any depressed condition; to begin, as a business; to advance, as a doctrine; to put in type. DEAD-SET, n. a fixed state or condition precluding further progress; the act of a setter-dog when it discovers game. To BE AT A DEAD-SET, to be in a fixed state or condition, precluding further progress. To MAKE A DEAD-SET UPON, to make a determined and importunate appeal to. SET or SETT OF A BURGH, in *Scots law*, the constitution of a Burgh (q.v.). SET-BACK, a flat plain set-off in a wall. SET-BOLT, an iron pin or bolt for fitting planks closely together. SET-DOWN, a rebuke that quiets or silences; a rebuff. SET-FAIR, the coat of plaster used after roughing-in, levelled and smoothed by a flat wooden instrument called a float. A SET-OFF, that which is used to improve the appearance; a decoration; a counter-claim (see below); an equivalent. A SET SPEECH, a speech carefully prepared before delivery. SET-TO, n. a conflict in boxing or argument, or the like. SETTING-COAT, the best sort of plastering used on walls or ceilings. SETTING-DOG, a dog trained to crouch at the sight or scent of game; a setter.

SETA, n. *sē'tă*, SETÆ, n. plu. *sē'tē* [L. *sēta*, a thick stiff hair]: a bristle or sharp hair; the bristle-like stalk that supports the theca, capsule, or sporangium of mosses; the awn or beard of grasses when proceeding from the extremity of a husk or glume; in *zool.*, SETÆ are the stiff short hairs that cover many caterpillars and insects; the bristles or processes that cover the limbs and mandibles of many crustaceans. SETACEOUS, a. *sē-tā'shŭs*, bristly; resembling a bristle; bristle-shaped. SETIFEROUS, a. *sē-tĭf'-ėr-ŭs* [L. *fero*, I produce]: producing or having bristles. SETIFORM, a. *sē'tĭ-fawrm* [L. *forma*, shape]: bristle-shaped. SETIGEROUS, a. *sē-tĭj'ėr-ŭs* [L. *gero*, I bear]: furnished with bristles for progressive motion; covered with bristles or with sharp stiff processes resembling hair. SETIREME, n. *sē'tĭ-rēm* [L. *rēmus*, an oar]: one of the legs of an aquatic insect when fringed with bristles, which enable it to move on the water.

SETA'RIA: see MILLET.

SETHE: see COAL-FISH.

SETHITES, *sĕth'īts:* obscure Gnostic sect of the 2d c., allied to the Ophites (q.v.), or worshippers of the serpent (see SERPENT-WORSHIP): they belonged to that class of religionists who, in evolving what they regarded as their system, approached paganism. Accepting the Christian mode of thought and its terminology, they utterly disregarded the great facts of Scripture history, maintaining that Seth reappeared in the person of the Messiah, and affirming that they possessed books written by him.—See Neander's *Kirchengeschichte* (Bohn's translation, II. 115).

SET-OFF, in Law: claim of a defendant which he alleges to counterbalance part or all of a plaintiff's demand. At common-law S.-O. was not admitted as a plea, but Eng. statutes of the 2d and 8th year of George II. allowed it, both for England and the Amer. colonies; and all the states have enacted statutes to the same effect. S.-O. is allowed only where the payment of money is concerned; hence A, sued by B for trespass, cannot plead a trespass by B as a S.-O. S.-O. is not allowed when the state is plaintiff. Again, the debt pleaded as S.-O. must be the individual debt of the plaintiff, not his debt as partner with C, D, etc.

SETON, n. *sē'tn* [F. *séton*, a seton—from L. *sēta*, a bristle; It. *setone*], in Surgery: artificially produced sinus or channel, through which some substance—e.g., a skein of cotton or silk, or a few horse-hairs, or a long flat piece of india-rubber or gutta-percha—is passed so as to excite suppuration, and to keep the artificially formed openings patent; also, the material so inserted; also, the ulcer so produced. Setons are established in the subcutaneous tissue of the body (1) as counter-irritants, or (2) to act as a drain on the system at large, or (3) to excite inflammation and adhesion. For counter-irritation, setons are inserted usually in the neighborhood of the affected parts; but for action as a drain on the system at large—e.g., in threatened head-affections—the nape of the neck is the part always selected. The operation is very simple. A longitudinal fold of skin over the spines of the cervical vertebræ is raised by the fingers from the deeper structures, and is transfixed by the seton-needle rather obliquely, so that one of the openings shall be rather more dependent than the other. The needle must pass somewhat deeply through the subcutaneous tissue, as, if it passed immediately beneath the skin, the latter would probably slough over the whole track of the wound. The inserted material should be smeared with oil, and may be allowed to remain undisturbed for four or five days, till there is free discharge of matter, after which a fresh portion should be drawn daily through the wound.

For exciting local inflammation and the adhesion which is its result, setons are employed in treatment of hydrocele, enlarged bursæ, ranula, bronchocele, ununited fractures, etc. In the two last cases, their use is not without danger.

The word *seton* is from the Latin *seta*, a hair, because hairs were originally employed as the inserted material. Indeed, at the present day, it is the custom of many of the nomadic tribes of central Asia to insert a hair into the heels of their prisoners, which lames them to such an extent as to prevent their escape.

SETON, *sē'ton*, ELIZABETH ANN (BAYLEY): founder of the Sisters of Charity congregation in the United States: 1774, Aug. 28—1821, Jan. 4; b. New York; dau. of Richard Bayley, M.D. With her husband William S , and her children, she visited Italy 1803, and there her husband died. Returning to the United States, she was received into the Rom. Cath. Chh. To support herself and 5 children she opened a school in New York, but it was unsuccessful. Then an opportunity was afforded her for executing a project that she had meditated, of founding a congregation of women for works of mercy to orphans and destitute children. A farm having been purchased near Emmittsburg, Md., Mrs. S. with three companions moved thither and founded a new order of charity. Soon the establishment comprised a residence for the members of the congregation ('sisters'), a novice-house, a boarding-school for girls, a day-school for poor children, and an orphan asylum. The first colony of sisters was sent to Philadelphia (1814); then colonies were sent to different the 'mother-house,' and the seat of govt. of the order. At the death of Mother S. there were 20 communities of her congregation conducting schools, orphanages and hospitals in Md., Penn., N. Y., Mass., Del., O., Va., Mo., La., and D. C. See her *Memoirs* (1817): and *Life of Mrs. Seton* by Chas. J. White, D.D., (7th ed., 1872).

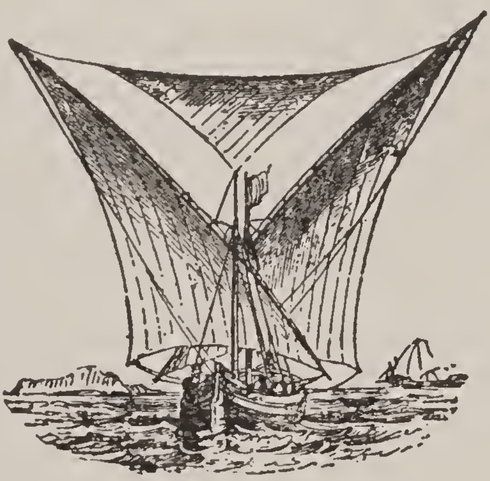
SETON HALL COLLEGE: Rom. Cath. educ. institution at South Orange, N. J.; founded (1856) by James Roosevelt Bayley, then bp. of Newark, later abp. of Baltimore; named in honor of his aunt, Mother Seton (see SETON, ELIUABETH ANN). 1902 there were 175 students, 28 professors; pres. of col., Rev. John A. Stafford, S.T.L.

SETOSE, *sē'tōs*, or Se'tous, a. *-tŭs* [L. *sĕtōsus*, bristly—from *sēta*, a bristle]: in *bot.*, covered or set with bristles.

SETT, n. *sĕt* [from Set, which see]: a power, as a screw, used in bringing two pieces together; in *mining*, a run or lode; a number of mines taken on lease; a piece placed upon the head of a pile, when too short, to enable the weight or hammer to reach it. **Sett of a Burgh**: see under Set.

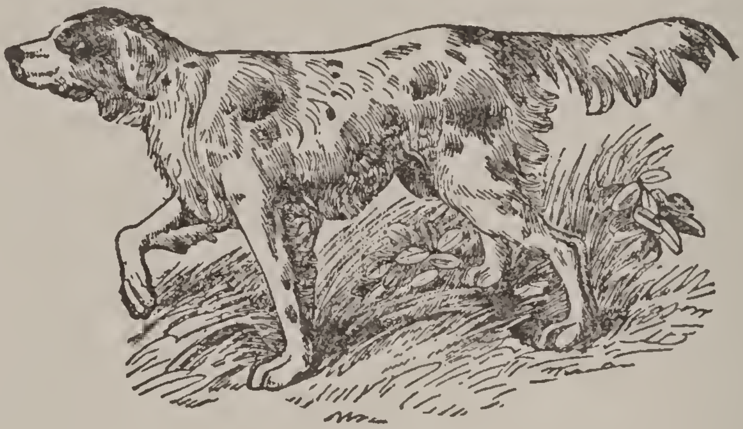
SETTE COMMUNI DI VICENZA, *sĕt'tā kŏm-mū'nē dē vē-sĕn'za* or *vē-chĕn'zâ:* district comprising seven communes or parishes in the neighborhood of Vicenza, whose language and population are plainly Teutonic, and have maintained themselves pure and unmixed in the midst of a Latin people from the days of the Roman Republic. The inhabitants are believed by antiquaries to be descendants of the remnant of the Cimbrian army which was defeated with great slaughter by Marius, and are supposed to have escaped to the mountains, and there made settlement. Their language is perfectly intelligible to any German scholar. Specimens of this dialect, and of a similarly isolated Teutonic dialect near Verona, are given by Adelung in the *Mithridates*, II. 215.

SETTEE, n. *sĕt-tē'* [from Set]: a long seat with a back to it; a vessel with a long sharp prow and two or three masts, carrying lateen sails, common in the Mediterranean.



Settee.

SETTER, *sĕt'tėr:* kind of dog named from its habit of *setting* or crouching when it scents game, instead of standing, like the pointer. Setters, however, are now trained to adopt the pointer's mode of standing while marking game. The S. was used originally to assist in capture of game by the net. It is supposed to have its origin from a mixture of the pointer and the spaniel. It is larger than the spaniel; its hair is less smooth than that of the pointer, and has more of the waved character of that of the spaniel, to which there is resemblance also in the ears. The tail is bushy. There are several breeds. The general color of the *English S.* is a white ground, with large spots or blotches of liver-color or red. The *Irish S.* has larger legs in proportion to the size of the body. The *Scotch* or *Gordon S.* is of rich black-and-tan color. The *Russian S.* is covered with woolly fur, much matted. Each of these breeds has its peculiar merits. All setters have the soles of the feet well covered with hair, so that they can bear hard work on rough ground. They soon become exhausted, however, unless they have access to water. The S. is much employed by sportsmen. It is one of the most affectionate, gentle, and intelligent of dogs.



English Setter.

SETTER, SETTING: see under SET.

SETTLE, n. *sĕt'l* [AS. *setl*, a seat (see SET)]: a long seat or bench with a high back; a stool.

SETTLE, v. *sĕt'l* [AS. *setl*, a seat or setting; *setlan*, to fix: Icel. *sætt;* AS. *saht*, agreement, peace (see also SET)]: to make permanent; to fix or establish in business, or in any way of life; not to suffer to continue doubtful in opinion or wavering in conduct; to establish; to confirm; to make close or compact; to tranquillize; to fix by gift or legal act, as an annuity; to colonize; to establish or ordain over a church or parish; to close by amicable agreement or otherwise, as a dispute; to balance or pay, as an account: to sink or fall to the bottom, as dregs or impurities; to become stationary or permanent; to quit an irregular for a methodical or regular life; to fix one's dwelling; to grow or become calm after agitation; to marry and establish a home; to sink by its own weight, as a building; to subside; to rest or repose. SETTLING, imp. *sĕt'lĭng:* N. the act of making a settlement; a colonizing; act of subsiding; an adjustment of difference. SET'TLINGS, n. plu. *-lĭngz*, the sediment which falls to the bottom of a liquid; dregs. SETTLED, pp. *sĕt'ld:* ADJ. fixed; stable. SETTLER, n. *sĕt'lĕr*, one who inhabits a new country; a colonist; *familiarly*, a decisive stroke. SETTLEMENT, n. *sĕt'l-mĕnt*, act of settling, or state of being settled; jointure granted to a wife; act of entering into a domestic state or marrying; act of planting, as a colony; the colony itself: right to parochial relief, or the residence by which it is claimed (see POOR—POOR-LAWS): liquidation or payment; conveyance of property real or personal, for certain purposes; mutual arrangement between living persons for regulating the present or future possession or use of property; in particular, conveyance to a married woman or to a woman in view of marriage (or to trustees in her behalf), of property for her own benefit during life, and that of her husband or children, or both, after her demise. In the United States, settlements at marriage are not common. If, after marriage, the husband settles a property on the wife and children, the settlement is valid, and the property cannot be attached by the husband's creditors, if, at the time of making it, he was not indebted. *Settlement* denotes also adjustment, as of differences or a claim; in *Scot.*, act of ordaining and placing a minister in a parish. SET'TLEMENTS, n. plu. *-mĕnts*, in *arch.*, those parts in a building in which defects by sinking have occurred; places where colonies are established, or the colonies themselves, as *British Settlements*. SETTLED ESTATE, estate held by some tenant for life, under conditions defined in the deed. To SETTLE ON OR UPON, to confer upon by permanent grant; to assure to. SETTLING-DAY, a day on which accounts are balanced and settled, as on the stock exchange; the prompt-day in the produce-market. ACT OF SETTLEMENT, in *Eng. hist.*, the act of 1702, by which the crown was limited to the house of the present queen.—SYN. of 'settle': to place; fix; establish; confirm; determine; affirm; compose; subside; sink; deposit; rest; repose; regulate; adjust; decide.

SETTLE, *sĕt'tl*, ELKANAH: minor Eng. playwright and poet: 1648–1723; b. Dunstable. After studying a while at Trinity College, Oxford, he went to London, to seek subsistence by literature. In 1671, he made something of a hit by his tragedy *Cambyses;* and the Earl of Rochester and others, wishing to annoy the great Dryden, loudly hailed in S. the superior genius of the two. Through the influence of Rochester, to his next tragedy, *The Empress of Morocco*, the unwonted honor was accorded of being played at Whitehall by the lords and ladies of the court, and in this way a great run was secured for it before the general public. In the insolence of success, the author printed with it a Preface, in which Dryden was severely assailed. This quarrel is all that keeps S. in remembrance: in the great satire, *Absalom and Achitophel*, Dryden scourged him with his scorn, so that he survives for us as a shrieking ghost. Having no real talent, he speedily relapsed into obscurity. The sometime rival of Dryden was fain to eke out a subsistence by writing verses for city pageants and festivities, and pieces to be acted in the booths of Bartholomew's Fair. In his destitute age, he was admitted to the Charter-house, where he died.

SETTLOR, n. *sĕt'lėr* [see SETTLE 2]: in *law*, a person who settles estates, either heritable or movable, by will or marriage contract, or, in *Scotland*, by disposition *mortis causâ* = 'for the cause of death'—that is, which will only take effect after death.

SETUBAL, *sā-tô'bâl* (frequently and erroneously called by the English St. Ube's): important seaport city of Portugal, province of Estremadura, 20 m. s.e. of Lisbon, on the north side of the Bay of S., which forms a magnificent harbor, though its entrance is obstructed by sand-banks. The harbor is furnished with a light house and with broad and handsome quays, and is protected by five forts; but the valley in which the town stands is completely commanded by neighboring heights. The town owes its importance chiefly to its trade in the muscadel and white wines, in sea-salt, oranges, lemons, and cork bark; there is also an active fishing industry. S. is the old Roman *Cetobriga*. In 1755, it suffered severely from an earthquake.—Pop. 17,000.

SETULIFORM, a. *sē-tū'lĭ-fawrm* [L. *sētŭla*, a little bristle—from *sēta*, a bristle; *forma*, shape]: in *bot.*, thread-like. Setulose, a. *sēt-ū-lōs'*, resembling a little bristle.

SEVASTO'POL; see Sebastopol.

SEVEN, n. *sĕv'n* [AS. *seofon;* Goth. *sibun;* Dan. *syv;* Gael. *seachd;* L. *septem;* Skr. *saptan*, seven]: six units and one more (see below): Adj. being or having seven. Seventh, a. *sĕv nth*, following the sixth; being one of seven equal parts into which a whole can be divided: N. that which follows the sixth; one of the seven equal divisions of a whole; one part in seven (see Seven, below): in *music*, an interval which is a semitone less than an octave—called a *major seventh*. Sev'enthly, ad. *-lĭ*, in the seventh place. Sev'enty, a. n. *-n-tĭ*, seven times ten. Sev'entieth, a. *-tĭ-ĕth*, the ordinal of seventy: N. one of seventy equal parts; one part in seventy; that which follows the sixty-ninth. Minor seventh, in *music*, an interval of four tones and two major semitones. Defective or Diminished seventh, an interval consisting of three tones and three major semitones. Sev'enfold, a. *-fōld* [*seven*, and *fold*]: repeated seven times. Sevennight, *sĕn'nīt* or *-nĭt* [*seven*, and *night*]: a period of seven days and seven nights; a week; now contracted into *se'nnight* or *sennight*. Sev'enteen, a. *-tēn* [*seven*, and *ten*]: seven and ten. Sev'enteenth, a. n. *-tēnth*, the ordinal of seventeen; the seventh after the tenth; one part of seventeen.

SEV'EN: frequently used as a mystical and symbolical number, also simply as a round number in the Bible, as well as among the principal nations of antiquity (Persians, Indians, Egyptians, Greeks, Romans, etc.). The reason for the preference of this number for sacred use has been found in its consisting of *three*—the number of the sides of a triangle—and *four*—the sides of a square, these being the simplest rectilineal figures:—or in other equally vague circumstances. The real reason, however, seems to be astronomical, viz., the observation of the 7 planets and the phases of the moon—changing every 7th day. (See Week.) As instances of the use of the number seven in the Old Test., we find the Creation completed in 7 days, wherefore the seventh day was kept sacred; every 7th year was Sabbatical, and the 7 times 7th year ushered in the Jobel-year or year of Jubilee. The three *Regalim*, or pilgrim festivals (Passah, Festival of Weeks, and Tabernacles), lasted 7 days; and between the first and second of these Feasts were counted 7 weeks. The first day of the 7th month was a 'Holy Convocation.' The Levitical purifications lasted 7 days, and the same space of time was allotted to the celebration of weddings and the mourning for the dead. In innumerable instances in the Old Test. and later Jewish writings, 7 is used as a kind of round number. In the New Test. we find in the Apocalypse the churches, candlesticks, stars, trumpets, spirits, all to the number of 7; and the 7 horns, and 7 eyes of the Lamb. The same number appears again either divided into half (3½ years, Rev. xiii. 5; xi. 3; xii. 6; etc.), or multiplied by ten—70 Israelites go to Egypt, the exile lasts 70 years, there are 70 elders, and at a later period there are supposed to be 70 languages and 70 nations upon earth. To go back to the earlier documents, we find in a similar way the dove sent out the second time 7 days after her first mission, Pharaoh's dream shows him twice 7 kine, twice 7 ears of corn, etc. Among the Greeks the seven was sacred to Apollo and to Dionysos, who, according to Orphic legends, was torn into 7 pieces; and it was particularly sacred in Eubœa, where the number pervaded almost every sacred, private, or domestic relation. Many ancient speculations connected the number seven with the human body and the phases of its gradual development and formation, its critical periods of sicknesses—partly still extant as superstitious notions. The Pythagoreans made much of this number, giving it the name Athene, Hermes, Hephaistos, Heracles, the Virgin unbegotten and unbegetting (i.e., not to be obtained by multiplication), Dionysos, Rex, etc. The 'seven sacraments,' the 'seven Free Arts,' the 'seven wise men,' and many more instances show the importance attached to this number. It had a great part in the superstitions of the middle ages.

SEVEN CHURCHES OF ASIA: churches established in Asia Minor, by the apostles: Ephesus, Smyrna, Pergamos, Thyatira, Sardis, Philadelphia, and Laodicea.

SEVEN DAYS' BATTLES, THE: see (Battles of) MECHANICSVILLE: GAINES'S MILL: SAVAGE'S STATION: FRAZIER'S FARM: MALVERN HILL: also CHICKAHOMINY.

SEVEN DEADLY SINS, in Rom. Cath. Theol.: Pride, Covetousness, Lust, Gluttony, Anger, Envy, Sloth.

SEVEN DO'LORS OF THE BLESSED VIRGIN MARY, FEAST OF THE: modern festival of the Rom. Cath. Church, instituted by Pope Benedict XIII. 1725; which, though bearing the name of devotion to the Virgin Mary, in reality regards those incidents in the life and passion of Christ with which his mother is most closely associated: it is celebrated on the Friday preceding Palm Sunday (q.v.). The 'dolors' or sorrows of the Blessed Virgin have long been a favorite theme of Rom. Cath. devotion, of which the pathetic *Stabat Mater Dolorosa* is the best-known and most popular expression: and the festival of the Seven Dolors is intended to individualize the incidents of her sorrows for meditation. The seven incidents referred to under the title of 'dolors' are: 1. The prediction of Simeon (Luke ii. 34); 2. The flight into Egypt; 3. The loss of Jesus in Jerusalem; 4. The sight of Jesus bearing his cross toward Calvary; 5. The sight of Jesus upon the cross; 6. The piercing of his side with a lance; 7. His burial.

SEVEN GIFTS OF THE HOLY GHOST, in Rom. Cath. Theol.: Wisdom, Understanding, Counsel, Fortitude, Knowledge, Piety, and the Fear of the Lord.

SEVEN PINES, Battle of: engagement in Henrico co., Va., 1862, May 31 and June 1. In advancing from Yorktown toward Richmond, the Union army under Gen. McClellan reached the Chickahominy river soon after the middle of May. Within a few weeks of this time, several battles were fought in this vicinity, and one occurred about two years later. (See Chickahominy, Battles of.) The left wing crossed the river May 20, felled timber, constructed rifle-pits, and prepared for attack. The battle known as Seven Pines, or Fair Oaks (one part of the force being at the former, and another at the latter point), began on the afternoon of May 31. The Union forces were commanded by Gens. Keyes and Heintzelman, and the Confederates by Gen. J. E. Johnston. The Confederates made the attack about 1 p.m. and forced back the Union troops. During the afternoon the latter were reinforced by a corps led by Gen. Sumner. Toward night Gen. Johnston was severely wounded, and the command of his troops was taken by Gen. G. W. Smith. Early the next morning the fighting was renewed. The Union troops soon regained the positions that they had lost the preceding day, and in a few hours the Confederate force was put to flight, leaving large stores of arms and ammunition. Gens. Heintzelman and Sumner desired to follow the retreating force to Richmond, which was only four or five m. distant, and could have been easily taken; but Gen. McClellan, though he had about 35,000 troops in reserve, did not take advantage of the situation. The battle was bravely fought on both sides. The Union loss in killed, wounded, and missing was nearly 6,000, and the Confederate loss about 8,000.

SEVEN PRINCIPAL VIRTUES, in Rom. Cath. Theol.: Faith, Hope, Charity, Prudence, Justice, Fortitude, Temperance. The first three are called also Theological Virtues, the other four are known as the Cardinal Virtues.

SEVEN SLEEPERS of Eph'esus: heroes of a celebrated legend, related first by Gregory of Tours in the close of the 6th c. (*De Gloria Martyrum*, c. 95), but of date assigned to the 3d c. and to the persecution of the Christians under Decius. According to the narrative, during the flight of the Christians from the persecution, seven Christians of Ephesus took refuge in a cave near the city, where they were discovered by their pursuers, who walled up the entrance, to starve them to death. A miracle, however, was interposed on their behalf: they fell into a preternatural sleep, in which they lay nearly 200 years. The concealment is supposed to have taken place 250 or 251; and it was not till the reign of Theodosius, 447, that they were reanimated. On awaking, they imagined that their sleep had been but of a single night; and on one of the party (supposing the persecution still in progress) going with caution into the city to purchase provisions privately, he was amazed to find erected in triumph, on the churches and other buildings, a cross, which, as it seemed, but a few hours before, he had seen the object of contempt and blasphemy. When he tendered at a baker's shop a coin of the time of Decius, their wonderful history became known, and they were conducted in triumphant procession into the city of Ephesus; but, according to one of various endings of the legend, they all fell asleep again at the same moment. The legend reappears with variations at later periods of Christian history.

SEVEN STARS: the Pleiades.

SEVENTEEN-YEAR LOCUST: see CICADA (*C. Septemdecim*).

SEVENTH-DAY AD'VENTISTS: one of several divergent branches of the followers of William Miller (q.v.). It originated 1844; and since 1855 has had the chief centre of its organization at Battle Creek, Mich. The S.-D.A. mostly believe that the prophetic 'cleansing of the tabernacle,' preceding the future personal advent of Jesus Christ, is of undetermined duration, and began about 1844. They advocate the seventh day as the Sabbath; baptism by immersion; the non-immortality of man; the final literal destruction of the wicked, after an intermediate state of sleep common to all, the righteous only receiving the gift of eternal life. In other respects they agree with the evangelical churches, but call the Bible their creed, and refer inquirers to such of their books as Uriah Smith's *Synopsis of Present Truth*. Their polity is congregational and independent. The Year-book, 1896, maps the United States in 6 general conference districts, several extending into Brit. America; gives 8 foreign conferences, of which 4 are in Europe, 2 are in Australia, 1 New Zealand, and 1 s. Africa. The Sabbath-school membership, U. S. and abroad, was 54,686, There is an International Medical Missionary and Benevolent Association, and at Battle Creek a very large Sanitarium, with a connected training-school for medical missionaries and missionary nurses. The publishing assoc. at Battle Creek has a plant of $211,-259.77; its total assets were $532,511.95, surplus $23,041.33. There is also a Pacific publishing company, with resources of $396,002 and and another in Australia. Statistics for 1896 are: ministers, 326; licentiates, 257, churches, 1,331; membership, 47,680, a gain of 64 per cent. since 1890; contributions for all purposes, $309,142. The membership is distributed principally as follows: Mich. has 14 per cent. of the total; Pacific states, 13 per cent.; Iowa, 6 per cent.; and Wis., Kan., and Minn., about 5 per cent. each. The principal educational institution is the Battle Creek (Mich.)

Coll., founded 1874, with preparatory and collegiate departments, and having (1895–6) a total of 24 instructors and 716 students; Geo. W. Caviness, A.M., pres. There are 8 colleges and academies in the United States, 1 in Europe, 1 in s. Africa, and 1 in Australia, besides numerous church and industrial schools in different parts of the world. The leading church papers are the *Advent Review and Sabbath Herald*, Battle Creek; and the *Signs of the Times*, Oakland, Cal. In 1902 there were in the U. S. 1,610 churches, 435 ministers, and 63,521 communicants.

SEVENTH-DAY BAPTISTS: see BAPTISTS, SEVENTH-DAY: SABBATH.

SEV'ENTY, THE; or ALEXANDRINE VERSION; usually SEPTUAGINT (often denoted by LXX.): most ancient extant Gr. transl. of the Old Test.: see SEPTUAGINT.

SEVEN WEEKS' WAR: the great conflict in 1866 for German supremacy, between Prussia and Italy on one side and Austria on the other, in which the two allied nations were victorious.

SEVEN WISE MASTERS: title of a mediæval collection of tales, important from its contents and its popularity. The idea of the work is as follows: A certain prince's son, instructed in all kinds of wisdom by seven sages, finds, from an examination of the stars, on his return to his father's court, that he is in danger of losing his life if he speaks a word within seven days. A revengeful woman endeavors to persuade his father to put him to death, each day relating an artful story with that wicked purpose, but its effect was daily neutralized by a rival narrative told by each of the sages. At the end of the seven days, the prince himself was enabled to disclose the base design.—The work is undoubtedly of oriental though unascertained origin. Some have thought to trace it in Arabic as a translation from Indian sources before the 10th c. Nearest to the original form appears to stand the *Eight Nights* of Nakhschebi, Persian adaptation of the Indian *Tutiname* (Brockhaus, Leip. 1845). It passed into the literature of w. Europe in the 11th or 12th c., through two redactions, a Hebrew and a Greek; and spread through Christendom, under all sorts of names, and with all sorts of modifications, in verse and in prose. Latin versions began to appear about the beginning of the 13th century.

SEVEN WISE MEN: collective designation of a number of Greek sages, who lived about B.C. 620–548, and applied themselves to the cultivation of practical wisdom. Their moral and social experience was embodied in brief aphorisms in verse and in prose. The names of the Seven, as usually given, are Solon (q.v.), Thales (q.v.), Pittacus (q.v.), Bias (q.v.), Chilon, Cleobulus, and Periander of Corinth; but there is not unanimity among the ancients either as regards the names, the number, the history, or the sayings of these famous sages, of which the fragments that have come down to us are in Orelli's *Opuscula Græcorum Veterum, Sententiosa et Moralia* (Leip. 1819).

SEVEN WONDERS OF THE WORLD, in Ancient Times: the Pyramids of Egypt, the Hanging Gardens of Semiramis at Babylon, the Temple of Diana at Ephesus, the Statue of Jupiter at Athens by Phidias, the Mausoleum (q.v.), the Colossus (q.v.) at Rhodes, and the Pharos of Alexandria. This cycle of seven wonders originated among the Greeks after the time of Alexander the Great, and were described in a special work by Philo of Byzantium, which has been edited by Orelli.

SEVEN YEARS' WAR, The: the third, last, and by far the longest (1756–63) and most terrible of the contests for the possession of Silesia (q.v.). During the two former wars, Empress Maria Theresa of Austria had too much other work on hand in maintaining her claims to the Austrian dominions (see Succession, War of Austrian) to offer very effective resistance to the aggression of Frederick the Great of Prussia; but after her triumph in the Austrian contest, she renewed the struggle for Silesia, which had been snatched from her at the moment of her greatest straits. She found Czarina Elizabeth, the King of Poland and Elector of Saxony, and Louis XV. of France (or rather Madame de Pompadour), ready for an offensive and defensive treaty with her. On the other hand, Britain (then at war with France) engaged to assist Prussia with an army in Hanover, and with subsidies when necessary. Frederick, resolving to anticipate his enemies, and secure a safe basis for future operations, made a sudden advance (1756, Aug.) on Dresden with 60 000 men, took possession of the country, which he governed from this time with slight intervals to the end of the war, and cooped up the Saxon army, 18,000 strong, between Pirna and Königstein. The Austrians under Browne, advancing to relieve their allies, were met by Frederick at Lobositz (Oct. 1), and after an indecisive contest, retreated. The Saxons then surrendered (Oct. 14). and were mostly incorporated with the Prussian army, which went into winter-quarters in Saxony and Silesia.—The *second campaign* (1757) began with the addition of Sweden (subsidized by France) as a fourth in the Austrian coalition, in order to recover Pomerania; and the German Reich or Empire raised an army of 33,000, to assist Austria. A combined attack was made by a French army (100,000) on Hanover; another French army (30,000) on Hesse-Cassel (ally of Prussia), with a view to reach Saxony; an Austrian army from Bohemia on Saxony and another on Silesia, both of them at first united under Marshal Daun, but (1760) separated under Daun and Loudon; the Russians (100,000) on the e. and n.e.; and the Swedes (22,000) in Pomerania; while the imperial army sometimes joined the s. French, and sometimes the w. Austrian armies. To oppose these armies, numbering in all 430,000. Frederick had the combined British-Hanoverian-Hessian army (60,000) in Hanover, and a Prussian army of 200,000, distributed over the various points attacked; but he relied much on the rapidity of his movements, and the completeness of his plans. In April, Frederick, leaving a corps of 24,000 under Lewald to resist the Swedes

and Russians, invaded Bohemia, drove in the advanced **corps** of the Austrians upon their main army, which he then completely routed at Prague (May 6), with a loss on his side of 18,000, and of 19,000 on the part of the Austrians; Marshals Schwerin (Prussian) and Browne (Austrian) fell in this conflict. Frederick immediately invested Prague, to which Prince Charles of Lorraine, with 46,000 men, had retreated, but Daun, who advanced from Moravia to its relief, inflicted on the Prussians a crushing defeat at Kolin (June 18), and forced them to retire from Bohemia. The n. French army had meanwhile, under Marshal d'Estrees, advanced into Hanover, defeated the incapable Duke of Cumberland at Hastenbeck (July 26), and compelled him to capitulate, on condition that the whole of his army, except the Hanoverians, should be disbanded. But the British govt. refused to ratify this shameful treaty, and speedily raised another army of similar composition, which was placed under Duke Ferdinand of Brunswick, who drove back the French, and proved himself so capable to hold them in check that Frederick ceased to have apprehensions from this quarter. The s. French army under Soubise had also advanced in conjunction with the imperialists under the Prince of Hildburghausen in the direction of Saxony, but Frederick, contesting this valuable vantage-ground, fell upon them at Rossbach (q.v.) (Nov. 5), and put them to rout. During his absence, however, the Austrians had broken into Silesia, defeated his armies, and compelled them to retire; so, compelled to utmost speed in returning, he collected a small army, defeated a thrice as numerous force of Austrians under Prince Charles of Lorraine at Leuthen (Dec. 5), and recovered Silesia. On the e., the Russians had appeared in great force, captured Memel, committing horrible devastations, and had routed Lewald at Grossjägerndorf (Aug. 30), when the change of Russian policy due to the illness and apparently impending demise of the czarina, caused them to relinquish almost all their conquests; Lewald then attacked and defeated the Swedes, driving them under the walls of Stralsund. Thus closed the second campaign, leaving matters much as at the commencement.—Duke Ferdinand opened the *third campaign* (1758) by driving the French from Lower Saxony, pursued them across the Rhine, and defeated them near Krefeld (June 23); but Contades, the new French commander, having obtained the co-operation of Soubise, compelled him to retrace his steps, till, receiving a reinforcement of 12,000 British, Ferdinand again advanced, throwing Contades between the Rhine and Meuse, and Soubise between the Rhine and Main. Meanwhile, Frederick had not been idle, for after being driven out of Moravia (which he had invaded in spring) by Daun, he marched n. with a portion of his army to meet the Russians, who—the czarina having recovered—had again invaded Brandenburg; and defeated them in a desperate battle at Zorndorf (Aug. 25), compelling them to retreat into Poland. Frederick's presence was next needed in Saxony, where his brother, Prince Henry, was hard pressed by Daun with superior forces; but on his arrival the Austrians retreated e. till Oct. 14, when Daun turned, took Frederick completely by surprise, and gave him a severe defeat at Hochkirch (q.v.), though before the end of the year the Prussians were again in possession of Saxony. Thus passed another campaign with a slight advantage to the Prussians.—The *fourth campaign* (1759), though signalized by only two great actions, was unfortunate for Prussia. The French under Soubise had captured Frankfurt during the winter, and the Duke of Brunswick, attempting to recover it, was defeated at Bergen (Apr. 13), by Broglie (successor of Soubise), and compelled to resign the whole of Hesse to the French; but his signal victory at Minden (Aug. 1) over Contades and Broglie, and that of his relative, the hereditary Prince of Brunswick, at Gohfeld on the same day, recovered most of Westphalia, and drove the s. French beyond the Lahn and Rhine. But in the Saxon district, though Prince Henry invaded Bohemia (Apr.), capturing immense supplies, and cleared Franconia (May) of Austrians and imperialists, he subsequently evacuated Saxony, which was then occupied by the imperialists, and Loudon's Austrians advanced into Lusatia. In Silesia, Fouqué gallantly kept the Austrians at bay; and Dohna continued to coop up the Swedes about Stralsund, keeping at the same time an eye on the Russians; but the latter soon gathered in such force that he was compelled to retreat. His successor, Wedel, attempting to bar their advance, was routed near Züllichau (July 23); and though Frederick hastened to his assistance, attacked them at Kunersdorf (q.v.) (Aug. 12), and had almost gained the day, the arrival of Marshal Loudon with an Austrian force turned the tide, and converted this almost victory into the most signal defeat of the Prussians during the whole war. On the following morning, he could hardly muster 5,000 men; but, luckily, the Russians did not follow up their victory; and by perseverance, the Prussian monarch succeeded in raising another army 28,000 strong. Though it seemed almost impossible for him to prevent the meditated junction of the Russians and Austrians in Brandenburg; yet, by skilful maneuvering, he succeeded in compelling the Russians to retire to Poland; and Prince Henry, by cutting off supplies, forced the Austrians into Saxony. Nov. 21, however, he suffered a severe blow in the capture of Finck with 11,000 Prussians, at Maxen in Saxony. With greatly diminished strength, an exhausted treasury (supplied chiefly by the English subsidy, the taxes of Saxony, and forced contributions on Mecklenburg, Saxony, and Anhalt), a desolated territory incapable of affording either men or supplies, and gloomy forebodings of the final issue, though with unfaltering resolution never to yield, Frederick prepared for his *fifth campaign* (1760).—His army in Prussia, now reduced to 90,000, mostly foreigners and raw recruits, was still further diminished by the capture of Fouqué with 8,000 men in Silesia, followed by Marshal Loudon's conquest of that province, though the brilliant victory of Liegnitz (Aug. 15) subsequently restored to Frederick the n.w. division of it; he then joined his brother, Prince Henry, drove the Russians across the Oder, and Daun into Bohemia; but his strength was now becoming glaringly insufficient for the task to which he had set himself; the Russians and Austrians captured and plundered Berlin (Oct. 3); the Swedes came down from the north, and Loudon's Austrians upward through Silesia, so that he was fairly in the toils But, like a lion in the midst of the hunters, he turned on his most able and pertinacious adversary, Daun, terribly routed him at Torgau (Nov. 3), in Saxony, then drove Loudon into Glatz, and frightened away the Russians to Poland, and the Swedes to Stralsund. In the w., the fortune of Prussia was in the ascendant, and the French, defeated by Prince Charles of Brunswick at Einsdorf (July 13), and by Duke Ferdinand at Marburg (July 31), were again confined to Hesse.—The *sixth campaign* (1761) on the Rhine began more auspiciously for Frederick, as the French were driven in detail from their strongholds, lost their supplies by capture, suffered defeat by the Hanoverians at Langensalza (Feb. 14), and by Duke Ferdinand at Villingshausen (July 15), though in the end Broglie and Soubise again gained possession of Hesse. In Silesia, Frederick attempted to bar the progress of the Austrians, so as to prevent their junction with the Russians and so opposing 130,000 men to his poor remnant of 50,000; but in vain; however, their junction was productive of no ill results to him, for scarcity of provisions speedily compelled the Russians to retreat to Poland, after which Loudon retired to Upper Silesia, capturing Schweidnitz with 3,700 men on his way. In Saxony, Prince Henry had to retreat before Daun, and the Prussians were ejected from Pomerania by the Russians and Swedes, all subsidies from Britain stopped by the Earl of Bute after George II.'s death, and the country ravaged in all directions; so that Prussia was almost at its last gasp. Frederick's assailants had cooped him up within s. Brandenburg and n.w. Silesia; and though he was as resolute as ever to fight on, it seemed that another campaign must bring him to ruin. But the death of the czarina 1762, Jan. 5, converted the most powerful of his enemies into a fast friend; Sweden, which had suffered uninterrupted reverses during the whole war, also retired from the alliance—and the *seventh campaign* (1762) began on equal terms, as Austria and France were almost as much exhausted as Prussia. On the refusal of Austria to submit her cause to arbitration, Czar Peter III. joined his army to that of Frederick; but his successor, Catharine II., ordered the return of the army, though her strict neutrality was itself an immense benefit. Frederick had now no fears for the result, nor had he reason for fears; for July 21 he drove an Austrian force from its intrenchments at Burkersdorf, and following up his success routed Daun at Reichenbach (Aug. 16), and took Schweidnitz (Oct. 9); while Prince Henry, by a series of fortunate maneuvers, possessed himself of the passes of the Erzgebirge, and with the valuable aid of Seidlitz, completely overthrew the other Austrian army at Freiberg (Oct. 22); and the two Brunswicks nobly sustained the glory of Prussia at Wilhelmsthal (June 24) and Luternberg (July 23), capturing Cassel, and recovering the whole of Hesse. France now gave up a contest from which she had gathered nothing but exhaustion and military disgrace, and concluded treaties with Britain and Prussia; while Prussia and Austria agreed to an armistice with regard to Saxony and Silesia, of which the astute Frederick took advantage to send Kleist on a raid through Franconia and Bavaria, which had the effect of withdrawing the minor German states from the coalition. Maria Theresa was now left alone, and sorely against her will was compelled to conclude the peace of Hubertsburg, 1763, Feb. 15, which finally acknowledged Frederick the lord of Silesia This long and desperate conflict made no change in the territorial distribution of Europe; but it increased tenfold the moral power of Prussia, and gave its army a prestige which it retained till the battle of Jena. It cost Europe a million lives, and prostrated the strength of almost all the powers who had engaged in it.—See for full account, Carlyle's *History of Frederick the Great.*

SEVER, v. *sĕv′ĕr* [F. *sevrer*, to wean—from L. *separāre*, to sever: It. *severare*, *sevrare*, to sunder (see Separate)]: to part forcibly from the rest; to rend asunder; to divide; to keep distinct or apart; to part by cutting; to put in different orders or places; to distinguish; to make a separation. Sev′ering, imp.: N. act of one who severs; a parting or disjunction. Sev′ered, pp. *-ĕrd.* Sev′eral, a. *-ĕr-ăl* [mid. L. *separālĕ*, something separate]: separate; different; consisting of a small number; more than two; distinct; divers: N. each particular, or a small number taken singly. Sev′eral′ity, n. *-ăl′ĭ-tĭ*, in *OE.*, a state of separation from the rest or from all others; distinction. Sev′erally, ad. *-ăl-lĭ*, separately; distinctly; apart from others. Severalty. n. *sĕv′ĕr-ăl-tĭ*, said of the lands or property which an individual holds in his own right and interest only. Sev′erance, n. *-ăns*, the act of severing. A joint and several bond or obligation, one signed by two or more persons, each being liable to pay the whole should the others fail to do so (see Joint and Several).—Syn. of 'sever': to part; divide; sunder; separate; segregate; disjoin; disunite; partition; detach; disconnect.

SEVERAL: see under Sever.

SEVERE, a. *sĕ-vēr′* [F. *sévère*—from L. *sĕvērus*, strict, severe: It. *severo*]: harsh; extremely strict or exact; apt to punish; earnest; rigid; stern; unpitying; austere; sober; sedate; intense, as cold; distressing, as pain; inclement, as the weather; searching, as a test or trial; excessive; rigidly adherent to a certain rule or standard, as applied to style in art; not employing unnecessary amplification or ornament, said of the style of a speaker or writer; close; concise. Severe′ly, ad. *-lĭ*, painfully; gravely; austerely; rigorously. Severity, n. *sĕ-vĕr′ĭ-tĭ* [F. *sévérité*—from L. *sever′ĭtātem*]: cruel treatment; harshness; rigor; extreme strictness; extreme degree; keenness; inclemency.—Syn. of 'severe': sharp; censorious; hard, rigorous; rigid; austere;

morose; harsh; cruel; inexorable; strict; close; grave; sober; sedate; painful; afflictive; concise; stern; exact; rough; tart; acrimonious; sarcastic; satirical; cutting; biting; keen.

SEVERIANS, n. *sĕ-vēr'ĭ-anz:* in *chh. hist.*, party of Monophysites who followed the teaching of Severus, who became patriarch of Antioch 513. He asserted that the body of Jesus, prior to his resurrection, was corruptible.

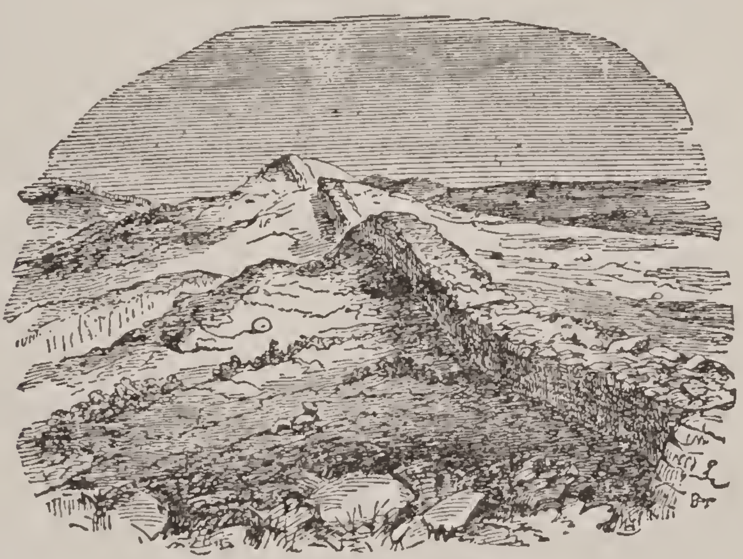
SEVERN, *sĕv'ėrn:* one of the most important and beautiful, and after the Thames the largest, of the rivers of England. It rises from a chalybeate spring on the e. side of Plinlimmon, about 11 m. w. of Llanidloes, in Montgomeryshire, N. Wales. Flowing e. to Llanidloes, to which town it retains its original British name Hafren, it afterward flows n.e. to the e. boundary of Montgomeryshire, then past Bridgenorth, and s. through Worcester and Gloucester, in which last it begins to form its estuary. It is navigable for barges to Welshpool, in Montgomeryshire, 180 m. from its mouth. Its entire length is 210 m., and it drains an area of more than 6,000 sq. m. The chief affluents are the Terne, and the Upper and Lower Avon on the e., and the Teme and Wye on the w. A canal 18½ m. long, navigable for vessels of 350 tons, extends from Gloucester to the upper portion of the estuary of the river, shortening the navigation of its lower course. The Montgomery canal extends from Welshpool to Newton, and other canals establish communication between the S. and the Thames, Trent, Mersey, and other important rivers of middle England. The *bore*, or tidal wave, which rushes up the S. with a velocity at times of 14 m. an hour, raises the water 9 ft. in height at Gloucester, below which embankments have been constructed.

SEVE'RUS, LUCIUS SEPTIMIUS: Roman emperor (the 21st): 146, Apr. 11—211, Feb. 4 (reigned 193-211); b. near Leptis Magna, on the n. coast of Africa, of a Roman family of equestrian rank. After an excellent education, he removed to Rome, where he became pretor 178. He was subsequently commander of a legion in Gaul, and gov. of Gallia Lugdunensis, Pannonia, and other provinces. After the murder of Pertinax, he was proclaimed emperor, 193, at Carnutum, and promptly marched on Rome, where the puppet Julianus had by purchase obtained the imperial purple. His arrival before Rome was the death-signal for Julianus; and after taking vengeance on the murderers of Pertinax, converting his most formidable rival, Clodius Albinus, into an ally by creating him Cæsar, and distributing an extravagant largess to his soldiers, he marched against Pescennius Niger, and conquered him at Issus, 195. A glorious campaign in the East, and a three years' siege, followed by the capture of Byzantium, were followed by a desperate struggle with his jealous rival, Clodius Albinus, whom, after an obstinate conflict at Lyon, in which 150,000 were engaged on each side, he conquered in 197. The usual games to the degenerate citizens of Rome, and largesses to the troops, followed;

after which S. returned to Asia, accompanied by his sons Caracalla and Geta, had brilliant success in the campaign of 198 against the Parthians, and took and plundered their cap., Ctesiphon. After a war with the Arabs, in which S.'s usual good-fortune deserted him, and a general visit to his various eastern dominions, he returned to Rome 202, and gratified the popular taste by the exhibition of shows of unparalleled magnificence, also distributing another extravagant largess to the citizens and pretorians. A rebellion in Britain drew him to that country 208; and at the head of an immense army, he marched, it is said, to the extreme north of the island, encountering enormous hardships, to which no less than 50,000 of his soldiers succumbed, and securing no permanent advantages. To secure to some extent the natives of s. Britain from the incursions of the Meatæ and Caledonians, S. repaired or partially built the wall which bears his name, and died soon afterward at York. S. was an able, vigorous, and just ruler, and a skilful though not great warrior; but of a cold, calculating nature, and totally devoid of high moral sentiment.

SEVE'RUS, Marcus Aurelius Alexander: see Alexander Severus.

SEVE'RUS, Wall of, as it has been erroneously called: rampart of stone which seems to have been built by Emperor Hadrian 120, between the Tyne and the Solway, on the border between England and Scotland. On the first subjugation of Britain by the Romans, a line of forts had been constructed by Agricola, extending from the Forth at Edinburgh to the Clyde at Dumbarton. Emperor Hadrian, visiting Britain 120, threw up for protection of the Roman province a wall of stone extending across the island, between the Tyne and Solway Firth. Twenty years later, Antoninus Pius, whose lieut., Lollius Urbicus, had gained fresh advantages over the northern tribes, endeavored to check the inroads of the Caledonians by erect-



A Portion of the Wall of Severus or of Hadrian, near Housestead, Northumberland.

ing a rampart between the Forth and Clyde, connecting Agricola's line of forts. But after a vain struggle of 60 years, the Romans found it necessary to abandon the whole district between the walls, and 208 Septimius Severus repaired the wall of Hadrian, hence erroneously called the wall of Severus. Toward the close of the 4th c., Theodosius, for a brief period, reasserted the Roman dominion over the district between the walls of Antoninus and Hadrian, which, in honor of Emperor Valens, obtained the name Valentia. But this newly established province was soon lost, and it was not long before the Romans finally abandoned Britain. Many remains of the Roman walls are yet traced. See Bruce's *Handbook to the Roman Wall* (3d ed. 1885).

SEVIER', John: pioneer: 1745, Sep. 23—1815, Sep. 24; b. Rockingham co., Va. The family was of French origin. S. was educated at the acad. in Fredericksburg, Va.; married at the age of 17 years, and founded a settlement, Newmarket, in the Shenandoah valley. He showed skill and prowess in conflicts with the red men, and was appointed capt. in the Va. line 1772. He moved to the new settlement of Watauga, across the Blue Ridge Mts., the same year, and rose at once to prominence by his military talent. He served with Lord Dunmore against the Shawnees 1773-4. Returning to his home at Watauga, he drew up, at the outbreak of hostilities between the colonies and England, a petition of the settlers to the legislature of N. C., asking for annexation: thus what is now Tennessee became a co. of N. C. S. was appointed co. clerk and judge; was elected col. by the people, and, enlisting every able-bodied man, harassed the Indians, himself performing brilliant feats of valor. When Tenn. became a state independent of N. C., S. was chosen gov. 1785, Mar. 1. Gov. Caswell of N. C. proclaimed the new govt. a revolt, and ordered it to be abandoned. S. was made prisoner. N. C. later ceded the territory to the United States, as 'territory s. of the Ohio river.' S. was appointed brig.gen. of the militia 1789, and chosen delegate to congress 1790. He was elected gov. of the state of Tenn. at its admission into the Union 1796, and was thrice re-elected; again after 1803 he was thrice re-elected to the governorship. He was representative of Tenn. in congress 1811-15, and at his death was member-elect for a third term. See Life, by J. R. Gilmore (1886).

SEVIER, *sĕv-ēr'*, Lake: lake of salt-water in Millard co., Utah, in the s.w. part of the territory, and in the S. desert; about 125 m. s.s.w. from Salt Lake City, about 4,600 ft. above sea-level. It varies in area, being considerably reduced in size when the air is dry and evaporation rapid, but in general is about 20 m. long and covers about 150 sq. m. There are no trees and few shrubs along its shores, and no islands in the lake. At the n. end it receives the S. river, its only tributary, and it has no outlet. Except on the n., it is bordered by mountains. Fish which reach the lake from fresh-water are killed by the brine, and are devoured by gulls and other birds which are constantly watching for them. Shrimps and the larvæ of insects are found in the water; and, so far as is known, this is the only animal life which it sustains. An analysis some years ago showed the water to contain, in 1,000 parts, 62·3 of chloride of sodium, 13·4 of sulphate of soda, 10·3 of chloride of magnesium, and 0·4 of sulphate of lime. The present area is only a portion of a former great lake covering most of the S. desert and discharging its waters into the Great Salt Lake; and at a still earlier time the Great Salt Lake with the S. Lake formed a body of water with width of 125 miles.

SÉVIGNÉ, *sā-vēn-yā′* (Marie de Rabutin·Chantal, *dèh râ-bü-tăng′-shŏng-tăl′*), Marquise de: writer of the most charming letters on record: 1626, Feb. 6—1696, Apr. 17; b. Paris; only daughter of Baron de Chantal, Celse-Benigne de Rabutin, and of his wife, Marie de Coulange. She was left early an orphan; and at the age of six the care of her education devolved on her maternal uncle, the Abbé de Coulange, an excellent and amiable man, who conscientiously acquitted himself of his charge, and for whom through life his niece entertained tender affection. She was carefully instructed in all the knowledge which then appertained to the education of a French gentlewoman; by the eminent scholar Menage she was taught Latin, Italian, and Spanish; and M. Chapelain, another literary notability of the time, assisted in her culture. At the age of 18 (1644, Aug. 1), she was married to the Marquis Henri de S., representative of an ancient house in Brittany. The union was not happy. The marquis was 'a man of wit and pleasure,' of the type of the period; his wit he exhibited by his happy way of squandering his wife's fortune, and he took his pleasure in neglect of her, and addiction to other women. In 1651 he was killed in a duel by a Chevalier d'Albret, his rival in a love-affair. Madame de S., left with a son and daughter, now for a few years retired almost wholly from society, and devoted herself to their education. In 1654 she returned to Paris, where her beauty, her wit, her happy social tact and vivacity, concurred, with the charm of her sweet and kindly nature, to insure her unrivalled success in the brilliant society of the period. Her lovers were legion, and among them were some of the most distinguished men of whom France could then boast, as the Prince de Conti, Turenne, Fouquet, supt. of finance, and others. But they sighed in vain: all offers of marriage she steadily declined; and from any of those lighter ties there and then most leniently regarded—if not almost considered *comme il faut*—not the least spot rested on her reputation. For her virtue she must have credit as virtue, and not merely the coldness which simulates it; for she was obviously of somewhat impulsive nature. Her numerous and warm friendships, with her absolute devotion to her children, may have sufficed as food for a heart not unlikely, in lack of these, to have craved a more perilous diet. Her affection for her daughter in particular who 1669 became Madame de Grignan, was the ruling passion of her life; and to the separation of the mother, over long periods, from 'this infinitely dear child,' the world is indebted for much the larger share of the collection of Letters which has given fame in perpetuity to Madame de Sévigné. Madame de Grignan was a beautiful and accomplished woman; but has by many writers been criticised as willing to permit rather than to appreciate or return a deep and ardent affection. She seems to have loved her mother after her own manner. It was the one main grief of Madame de S. to be forced to live apart from her daughter. In 1696, while on a visit to the Château de Grignan, she was seized with malignant small-pox, and died at the age of 70.

The Letters of Madame de S., on which her fame securely rests, are most charming in the *abandon* and easy *naïve* frankness with which they reveal her beautiful nature. They sparkle with French *esprit*, and spontaneous gayety of heart; and their writer is probably not equalled in the delicate *finesse* with which, in a few careless, rapid words, she flings off a scrap of light narrative, dashes in a little graceful picture, or points a dramatic situation. Above all remarkable is the lightly-moved and ever-active sympathy which keeps her exquisitely *en rapport* with the interest of whatever may be passing before her. See Life by Miss Thackeray (1881).

SEVILLE, *sĕv′ĭl* or *sė-vĭl′:* province in Andalusia, Spain, at one time a Moorish kingdom; surrounded by Badajoz on the n., Cordova on the e., Malaga and Cadiz on the s., and Huelva on the w.; 5,429 sq. m. Most of the s. portion is comparatively level, but in the n. are offshoots of the Sierra Morena Mts. It is watered by the Guadalquivir and several rivers tributary to it, of which the Guadalimar, Guadiaira, and Genil are largest; and is traversed by various railroads. In a large part of the province the soil is fertile and yields a variety of products, and the pastures are noted for excellence. In the elevated regions are quarries of marble and chalk, and mines of salt, lead, iron, coal, copper, and silver. Fabrics of silk and wool, earthenware, soap, glass, chocolate, paper, leather, and tobacco, also ardent spirits, are manufactured; and oranges, olives, wine, and oil are largely exported. Among the larger towns are Seville, Carmona, Ecija, Osuna, and Utera. Pop. (1887) 543,944; (1900) 555,256.

SEVILLE, *sév′ĭl* or *se-vil′* (Sp. *Sevilla, sā-vēl′yâ*, the *Hispalis* of the Romans): famous city of Spain, former cap. of the ancient kingdom, and now of the modern province of S.; on the left bank of the Guadalquivir, 94 m. by railway n.n.e. of Cadiz. The city is almost circular in shape, surrounded by Moorish walls, surmounted with 66 (formerly 166) towers, and pierced with 15 gates; and is 5 m., or, including its 10 suburbs, 10 m., in circumference. Held by the Moors for five centuries, and entirely rebuilt by them from the materials of former Roman edifices. S. was long a purely Moorish city, and the old Moorish houses, which age, in this dry climate, has done little to destroy, are still the best houses. Half of the city still preserves its ancient character; but changes are taking place every year. The narrow tortuous streets that kept out the sun, with their wide spacious mansions, with ample courts and gardens, perfectly suited to the climate, are giving way to spacious straight streets of small, warm houses, open to the blaze of noon. The cathedral, one of the largest and finest in Spain, is an imposing edifice, of which the solemn and grandiose are the distinctive qualities. It was completed 1519; is 431 ft. long, 315 ft. wide; has 7 aisles, and an organ with 5,400 pipes. The pavement is in black and white checkered marble. The cathedral is superbly decorated. Its painted windows are among the finest in Spain, and it contains paintings by Murillo, Vargas, the Herreras, etc. Attached to the cathedral is one of the most remarkable towers in the world, called the Giralda (i.e., a weather-cock in the form of a statue), and in all 350 ft. high. This Moorish tower was built 1196, and was originally only 250 ft. high, the additional 100 ft. being the rich filigree belfry added 1568. The pinnacle is crowned by a female figure in bronze, 14 ft. high, 2,800 lbs. in weight, which veers about with the slightest breeze. From this great tower the *Muezzin* (q.v.) of Mohammedan days called the faithful to prayers. The royal residence, the Alcazar (*Al-Kasr*, house of Cæsar), contains several noble halls, and much delicate ornamentation, rivalling that of the Alhambra. The house in which Murillo lived and died is still seen here. The finest pictures in S. are in the cathedral, the Caridad, the Museo, and the university. S. contains 74 churches; but prior to the suppression of monasteries, it contained 140. Besides the univ. (of four faculties), there are many educational institutions. The city contains more than 100 squares. The Fabrica de Tabacos, a factory of snuff and cigars, employs several thousand hands, mostly women. The Plaza de Toros can accommodate more than 12,000 spectators. There is regular communication with Cadiz by river and rail. There are several royal foundries and factories for arms, and porcelain and iron and machine works. Weaving, soap-making, and other manufactures are carried on. Pop. (1887) 143,182; (1900) 148,315.

The Hispal of the Phœnicians, the Hispalis of the Romans, was corrupted by the Moors into Ishbilliah, of which it is supposed the modern name is a modification. It was a place of great importance in the later period of Roman dominion; became cap. of s Spain during the ascendency of the Vandals and the Goths, when it was the scene of two notable church councils (590 and 619); and fell into the hands of the Moors in the 8th c., under whom it rapidly rose to splendid prosperity, and reckoned 400,000 inhabitants. In 1026 it became cap. of the Moorish kingdom ruled by the Abadides, from whom it passed 1091 to the Almoravides, and 1147 to the Almohades. In 1248 it was taken by Ferdinand III. of Castile, when 300,000 Moors left for Granada and Africa; and from this time to the removal of the court to Valladolid in the reign of Charles V., S. was cap. of Spain. The city rose to its climax of prosperity after the discovery of the new world, when it became the residence of princely merchants, and the mart of the colonies; but its trade was afterward transferred to Cadiz. In 1810 it was taken and ravaged by Soult. It capitulated to Espartero 1843.

SEVILLE ORANGES, *sĕv′ĭl:* the bitter oranges imported into this country from *Seville,* in Spain; the *Citrus vulgārĭs*, ord. *Auran′tĭăcĕæ.*

SÈVRES, *sāvr:* small town of France, dept. of Seine-et-Oise, six m. s.w. of Paris, on the Paris and Versailles railway. It is celebrated for manufacture of porcelain wares, unsurpassed for elegance of design and beauty of painting. Painted glass also is manufactured. The Porcelain Museum, which was destroyed during the war of 1870, contained a large and curious collection of articles in china and earthenware from all parts of the globe. Pop. (1896) 7,317.

SEVRES, DEUX-, *dêh-:* inland dept. in w. France, between the depts. Vienne on the e. and Vendée on the w.; 2,315 sq. m. The dept. takes its name from two rivers of the same name, the Sèvre-Niortaise, which flows w. into the sea, and the Sèvre-Nantaise, affluent of the Loire. It is traversed from s.e. to n.w. by a chain of hills, called in the s.e. the Monts du Poitou, and in the n. the Plateau de Gatine. This ridge forms the water-shed between the Loire on the n. and the Charente on the s. The climate is generally healthful, and the soil, two-thirds of which is arable, is very fertile. There are numerous iron mines, and good quarries of freestone and marble. The arrondissements are Niort, Bressuire, Melle, and Parthenay. Niort is the capital.—Pop. of dept. (1876) 336,655; (1886) 353,766; (1891) 354,282; (1901) 342,474.

SEVRES PORCELAIN, *sāvr:* highly valued glazed earthenware or china, manufactured at *Sèvres*, in France.

SEW, v. *sō* [Goth. *siujan;* Dan. *sye;* Sw. *sy;* L. *suĕrĕ;* AS. *siwian*, to sew]: to join or fasten together by means of a needle and thread. SEW′ING, imp.: N. the art or occupation of using the needle; needlework. SEWED, pp. *sōd.* SEW′ER, n. *-ėr*, one who sews. TO SEW UP, to inclose in anything sewed; to inclose by sewing. SEWING-MACHINE, machine for sewing or stitching cloth (see below). SEWING-NEEDLE, a needle used in sewing. SEWING SILK or THREAD, silk or thread used for sewing.

SEWAGE, n. *sṓ′āj* [Norm. F. *essuier* or *seuwière*, a conduit, the drain of a pond: OF. *esuer*, to dry—from mid. L. *exsucārĕ*, to deprive of moisture—from *ex*, out of; *sūcus,* juice; *sūgo*, I suck: Gael. *sùg*, to imbibe; *sùgh*, juice, moisture—and as a verb, to drink up, to drain: It. *suco,* juice]: the used water and liquid filthy matter of a town. SEW′ER, n. *-ėr*, a channel or pipe to carry off the used or surface water and the liquid filthy matter of a town. SEW′ERAGE, n. *-āj*, drainage by sewers; sewage; system of conduits or pipes laid underground for carrying off the liquid filth of a town: see below.

SEW′AGE: see SEWERAGE.

SEWAGE EARTH-CLOSET: contrivance in which the powerful deodorizing and other properties of dry earth are made available to deprive refuse of offense or harm. There are numerous forms of this kind of closet; one of the simplest consists of nothing more than a seat and a pan, the latter being lined round with earth by the help of a movable central mold or core. More convenient forms consist of a pail or a square-shaped pan on wheels under the seat, and an earth-box rising above it at the back. By one of several devices in use, a valve is opened at the bottom of the earth-box, which allows the proper quantity of earth to descend through a spout and cover the deposit. The earth-closet system is scarcely practicable in large towns, as it would be difficult to plan an economical arrangement by which the large quantities of earth required could be carried to and fro. But it has been used in villages, and in some large isolated buildings, such as jails and hospitals, and has found favor in India. In the United States it has been tried on a considerable scale: a competent authority reports that 'experience has taught that its power for usefulness is restricted by the difficulties involved in procuring, preparing, and removing the dry earth required in its use; and to some extent by those which attend, mechanically and chemically, the application of the earth to the dejecta. The inherent defects of the earth-closet reside in the seeming impossibility of obtaining just such perfection of mechanism as will completely do the required work automatically. It should never operate by weights, which act badly, and interfere with the space beneath.'—See SEWERAGE.

SEWALL, *sū'al*, JONATHAN: lawyer: 1728, Aug. 24–1796, Sep. 26; b. Boston, Mass. He was educated at Harvard, and began the practice of law in Charlestown 1758. He adhered to the cause of the crown at the beginning of the quarrel between the colonies and the mother country; became attorney-gen., advocate-gen., and was appointed to other places of emolument. He was an eloquent pleader and an acute expositor of the law. He won the release of a slave from bondage on the ground of the Eng. common law 1769, two years before that decision was reached by the courts in England. He made a spirited defense of the doctrines of coercion in the newspapers of the time. His house was wrecked by a mob 1774, and S. took refuge in England. He afterward settled in St. John, New Brunswick.

SEW'ALL, JOSEPH, D.D.: Congregational minister: 1688–1769; b. Boston, Mass.; son of SAMUEL S. He was educated at Harvard, graduating 1707; was ordained to the ministry 1713, and became colleague pastor of the Old South Church, Boston; this pastorate he held with great acceptance till his death. S. was offered, but declined, the presidency of Harvard Coll. 1724.

SEW'ALL, Samuel: jurist: 1652, Mar. 28—1730, Jan. 1; b. Bishopstoke, England. In his childhood he came with his parents to New England, and settled in Newbury, Mass. He graduated at Harvard 1671. He then studied theology, but after preaching once left the ministry. First he had charge of the printing-press in Boston for three years. He spent a year in England 1688. He was appointed member of the council and probate judge 1692. He was prominent among the judges who took part in the trials of the Salem witches. At the time, he was firmly convinced of the reality of witchcraft, and of the guilt of the alleged witches; but he soon became convinced of his error (which long afterward remained prevalent throughout Europe), and made public confession of his error, standing up before the congregation of the Old South Church, Boston, 1697, Jan., while his written confession was read by the minister. Thereafter for 31 years he annually gave one day to fasting and meditation upon his offense. He became chief-justice of Mass. 1718. He defended the rights of slaves in a tract *The Selling of Joseph* (1700); other writings by S. are: *The Accomplishment of Prophecies* (1713); *Memorial Relating to the Kennebec Indians* (1721); *Description of the New Heaven* (1727). His valuable MS. diaries and letter-book have been published in the *Collections* of the Mass. Hist. Society.

SEWARD, *sū'ėrd*, **William Henry**, LL.D.: statesman: 1801, May 16—1872, Oct. 10; b. Florida, Orange co., N. Y. He was educated in the academy at Goshen in the same county, and at Union Coll., from which he went south to teach, before completing his course, but returned and graduated 1820. His law studies were pursued with John Anthon, of New York, and at Goshen. Admitted to practice in 1822, he settled the next year in Auburn, N. Y., as partner of Judge Elijah Miller, to whom he soon became son-in-law. He was active in favor of John Quincy Adams, in the Adams-Jackson-Crawford presidential contest of 1824, and again in 1828; having been chairman, the preceding year, of a young men's state convention to promote the election of Adams. His party, however, failing to give full support to its nominee, was disintegrated. In 1830 he was elected anti Masonic member of the state senate, though he had previously declined nomination to congress by the anti-Masons. In the senate he was prominent in advocacy of public improvements, both commercial and educational, and in introducing an act against imprisonment for debt. On his motion the documents for the *Colonial History of New York*, published in a series of volumes by the state, were collected in this country and Europe. He defended the United States Bank 1832, and on the removal of its deposits condemned the measure in an able and memorable speech. At the close of each session he was selected to draught a minority address to the people. In 1834 he was nominated for gov. by the whig party, which had arisen from the ruins of the national republican; but he failed of election. Two years subsequently he accepted an agency to mediate between the

Holland Land Company and its tenants, in w. N. Y.; and, though it was a difficult matter to settle, regarded even as endangering the personal safety of an agent, he succeeded so well that his unpopular task did not interfere with election to the governorship 1838. His term of administration was distinguished by liberal measures in regard to prisoners and the insane, recommended by him; but he incurred odium in advocating the extending of privileges to Rom. Catholics and foreigners, in respect to immigration, public schools, and political status. A great service rendered by him was in helping on the geological and natural-history survey of the state, the foundation of all succeeding state surveys, as the names of geol. periods and epochs witness: for the splendid series of reports, he wrote an able introduction, reviewing the achievements of the state in all departments. His second term as gov., 1840–42, is associated with the enlargement and extension of canals and the encouragement of railroads.

In the intervals of public life he was busy with law practice; and some of his most celebrated arguments in court were on the side of humanity, for its own sake, such as that for Van Zandt, on the charge of helping fugitives from slavery, and in defense of the negro Freeman, who murdered a whole family in Auburn. The people were excited even to the point of lynching the culprit, and it required no small courage to stand up alone for the prisoner. The defense was perhaps unfortunately that of 'moral insanity,' for the murderer was of low-grade intellect, and, on his death in prison some time afterward, his brain was found to be abnormal, probably from a cruel assault long before.

Although Mr. S. had at first been opposed by abolitionists, he was recognized as in harmony with them while gov., when he favored negro suffrage, and still more after his anti-slavery speech at Cleveland, not long before his election to the U. S. senate 1849. He had become an anti-slavery leader. It was in 1850 that he held up the 'higher law' that, from that moment, grew to be a common phrase, and later in the same year he made a speech on the compromise measures, as notable as his arguments on the repeal of the Missouri Compromise 1854. He opposed the southern policy of Fillmore 1850–53, and the platform on which Scott was nominated, but not Scott himself. He was re-elected senator 1855; was a supporter of Fremont 1856; made his 'irrepressible conflict' speech at Rochester 1858; travelled in the Orient 1859; received 173 votes out of 275 on the first presidential nominating ballot at Chicago 1860; and was sec. of state 8 years, under Lincoln and Johnson, opposing the impeachment of the latter and sustaining his policy. Severely wounded by one of the conspirators at the time of Lincoln's assassination, he slowly recovered. His service was very great in dealing with foreign powers during the civil war, in treaty-making, and in acquiring Alaska. After retiring from public duty he made extensive journeys in N. America and abroad. His many speeches and scholarly orations, and his history of his life and times (completed by his son), are included in his Works, 5 vols. (1853–84). He published *Life and Public Services of John Quincy Adams* (1849). He died at his home in Auburn.—His son, Frederick William S., LL.D., born 1830, graduated at Union Coll. 1849; practiced law in Rochester: was co-editor of the Albany *Evening Journal*; assistant sec. of state under his father, also under William E. Evarts; and was member of the N. Y. legislature 1875. He published the life and letters of his father (1877).

SEWELL, *sū'ĕl*, William Joyce: statesman: b. Castlebar, Ireland, 1835, Dec. 6. Left an orphan, he came to the United States 1851, and first engaged in mercantile business in New York; but then followed the sea for some years. At the outbreak of the civil war he became capt. of a N. J. regt.; rose to be col., and commanded a brigade at Chancellorsville; was brevetted brig- gen and later maj. gen. He was member of the N. J. senate 9 years and U. S. senator since 1881. He died 1901, Dec. 27.

SEWELLEL, *sē-wĕl'lĕl* (*Haplodon rufus*, formerly *Aplodontia leporina*): rodent of the family *Diplodontidæ*, which is characterized by the dental formula—

$$i\,\frac{1-1}{1-1},\ c\,\frac{0-0}{0-0},\ pm\,\frac{2-2}{1-1},\ m\,\frac{3-3}{3-3},$$

the molars being prismatic, without roots, and with simple crowns; the salivary glands are of great size; the carpals and metacarpals are 9. The S. is most nearly related to the beaver, but has a short tail, and is of the size of a musk-rat, which it resembles in form. The color is dark-brown, gray beneath. It burrows in the ground, is nocturnal in its habits—hence is seldom seen. Its food is roots and other vegetable substances. Peculiar to N. America, it is found in Or., Wash., and Cal., where, it is claimed, another species, *Californicus*, occurs. Other names of the S. are Mountain Beaver, Boomer, and Showt'l, the last in the Nisqually language. S. is a corruption of She-wal-lal, which is an Indian word for dress made of the skins of the animal.

SEWER, n. *sū'ėr* [AS. *seaw*, juice—the same as OE. *sew*, pottage, boiled meat: comp. Low Ger. *sode* and *sōe*, so much as is boiled at once: W. *saig*, a dish of meat]: in *OE.*, an officer who placed and tasted the meat of a king or nobleman on the table; a head-servant who presided over the meats.

SEWER: see under **Sewage.**

SEW'ERAGE: process and system of receiving and removing from dwellings and other constructions refuse materials suspended in water; also the materials so removed, but these are more properly denominated *sewage.* During the first two or three days after sewage is deposited in water, the smell is unpleasant, but the emanations are not dangerous to health; after that, putrefaction begins, and the gases given off become deleterious. Here, then, is time for removal, and a punishment for neglect. Fevers, gangrene, ophthalmia, and many other diseases, especially among children, are certain to break out and become malignant if the emanations from human excreta exist in the air around human habitations. Formerly privy-pits and cesspools were in almost universal use. In the country, the former were generally in the garden attached to the house, and at some distance, so that frequently but little danger attended them. In the towns, cesspools, usually near the houses, were very objectionable and dangerous, and constantly neglected: they were large under-ground tanks of brick-work, into which all the sewage from the house was discharged. In them the filth accumulated and putrefied until it was periodically removed by scavengers. They acted like an immense brewing vessel, sending up deadly vapors which had no escape, except back into the house among the inhabitants The cesspools also frequently leaked, and so, if any wells were near, poisoned the water. When Bramah invented the water-closet, and larger supply of water had to be found for towns, the cesspools began to overflow at such a rate that a general revision of the whole system became necessary; and at the same time, medical men began to insist on the continuous and perfect removal of filth as the only trustworthy sanitary process of dealing with the matter. A return to the use of cesspools in any form would therefore be a step in the wrong direction, and would lead to disastrous results.

The subject of S. may be divided as follows: 1. As pertaining to small, cheap rural dwellings; 2. To larger dwellings and other buildings in the country; 3. To cities, villages, and closely built towns; 4. The utilization of sewage.

1. *Small, cheap rural dwellings,* usually single and detached.—Expensive arrangements such as those necessary for water-closets can scarcely be provided in such cases, and some simpler plan must be followed.

It is very objectionable to allow either cesspool or privy-pit, if they can be avoided, as they are constantly neglected, and overflow into some stream, or poison the wells and the air. The whole sewage-matter should be received in a square galvanized iron pail or pan under a seat, which pan can be removed from the outside, and into which a small quantity of house-ashes should be placed, either daily, or as often as the closet is used. This will quite fix the ammonia. The iron pan must be removed at least once a week, and emptied into the garden. No danger can arise from this, if strictly followed, and thus all the sewage-matter is placed to its best purpose. This system has been found feasible. See fig. 1.

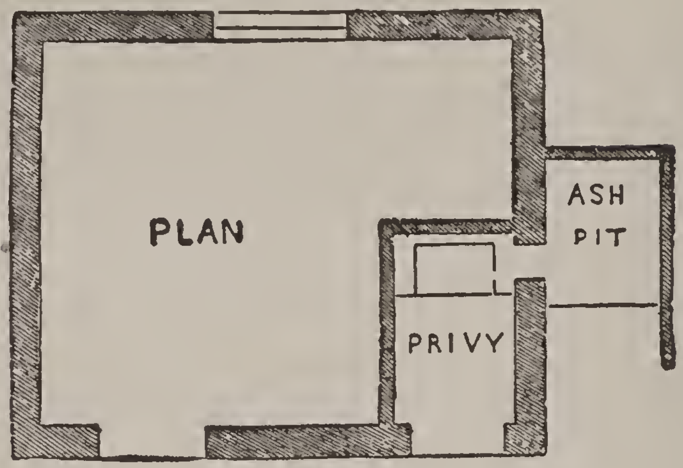


Fig. 1.

2. *Larger dwellings and other buildings in the country.*—It would be useless to discuss a dry-earth system, like that above mentioned, anywhere but for outhouses attached to the cheap class of rural dwellings; the general feelings of the inhabitants would not tolerate it. We must therefore accept the water-closet as the system universally adopted. In planning the position of water-closets for a house, unless in a climate liable to severe winter cold, they should be arranged if possible on the north or cool side of the house, and on exterior walls. If in the interior of the house, it is troublesome to get access to the drains when required, and the closets themselves are with difficulty ventilated. If the closet is inside the house, then only some of the improved forms with well-arranged trap underneath should be used; but if the closet is outside, then a less expensive one with siphon earthenware trap may be adopted. Where the liability to freezing is great, the necessity may exist for some warmer or even interior location for the water-closet. It is desirable that the closet be surrounded with brick walls, and, in fact, isolated from all other parts of the house. The window of the closet when inside the house should always reach the ceiling; and a ventilating shaft in the manner shown in the accompanying sketch is desirable where the closet is much used and the window cannot be left always open. The ordinary water that passes into the drains leading from any closet—such as is discharged each time that the handle is raised—is not sufficient to sweep out thoroughly all the solid matter from the drain-pipes; therefore a flushing apparatus at the highest point of all sets of drains is essential, so that a body of water may be allowed to pass down with a rush at least twice or thrice a week. It is requisite also that the foul air engendered in the drain-pipes themselves should have some free outlet into the air at some point where it will not be injurious. The gas given off under such circumstances is very light, and has a great tendency to ascend and draw toward heat. During the greater part of the year, especially in furnace-warmed

houses, the temperature of living rooms is much higher than the atmosphere outside; thus a pumping action is exercised on the drains, or indeed on any outlet for a fresh supply. If, therefore, some safety-valve is not provided, the gas will force an entry either through the traps or some imperfection in the joints of the drains. Fig. 3 shows a plan both for flushing and for ventilating the soil-pipes of water-closets. In constructing the drains from houses or large public buildings, it is now well decided that there should be an entirely separate system for the sewage or foul water, apart from that for rain and surface-water (for the reasons, see below, under *Cities, Villages, etc.*). Stoneware pipes are the best material for drains, because they are perfectly non-absorbent; but in many cases glazed earthenware will suffice. The smallest size of pipes of any kind for removing sewage from a house is, according to some authorities, 6 inches in diameter: others advocate a smaller size as affording less opportunity for back-draught from the street sewer. The size may be made larger: a pipe of 9 inches will remove the sewage of 500 people. The best fall to be given to a sewage-drain is 1 inch in 10 ft.; but all will work well from 1 inch in 5 ft. to 1 inch in 60 ft.—provided the flushing arrangements are as they ought to be. To keep the drains clean, not less than 10 gallons of water daily should pass down the drain for every person in the house; any quantity more than 25 gallons is superfluous. At every 20 yards there should be one length of pipe laid whose upper half can be removed, and the interior inspected at any time, and any stoppage remedied without necessity of breaking the pipes; or better, the drain-pipes might be made with the top removable throughout. Greasy water, such as is poured down from the kitchen and scullery of a house, is one of the constant causes of such stoppages: the fat, as it cools, congeals on the sides of the pipes, and

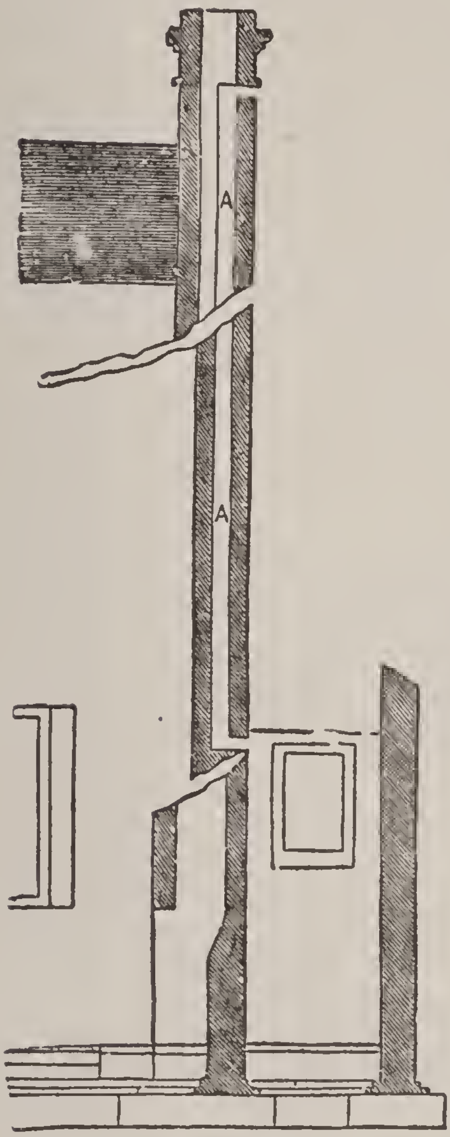


Fig. 2.

AA is the ventilating shaft by which any foul air in the closet itself can pass upward into the open air. By placing it alongside of a chimney, a draught is created which will empty the closet of any effluvium that may be in it.

forms a hard cake. The best method of preventing this is to form a small cesspool, into which the kitchen water is poured first, and then to take from this an overflow through a siphon into the foul drain, so that only the liquid enters, while the grease can be removed by hand from the cesspool. The sewage having been thus all thoroughly removed from the house, a sewage-filter should be built on the principle shown in the sketch fig. 4. The solid and liquid matters of the sewage are here mechanically separated, and the solid can be removed from time to time—say once in six weeks or two months—while the liquid may be passed on for irrigation. It is clearly unsafe, and often illegal, to pass it in large quantities into any open stream, unless possibly one of unusual size and swiftness; and it is apt to become a serious nuisance if anything else is done with it. For the best method of utilizing this liquid, see the fourth head. It is always advisable to get space for all these arrangements on the n. or e side of a house, when possible, so as to run no risk of contaminating the air on the s. or warm side of a dwelling; and if a belt of trees can be placed between the sewage-filter and the irrigated land and the house, it will be advantageous.

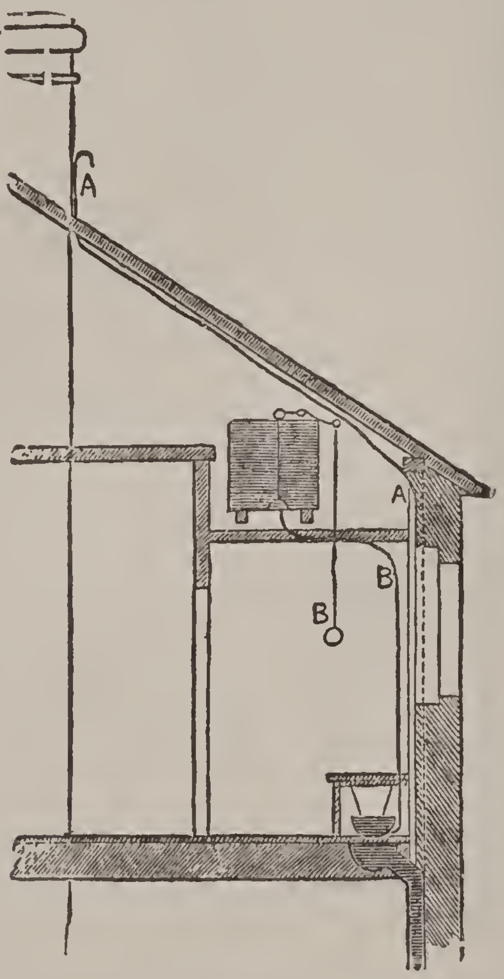


Fig. 3.

AA is the ventilating pipe communicating with the soil-pipe; BB is the flushing apparatus for discharging a quantity of water at once.

3. *Cities, Villages, etc.*—Until the last half-century, the drainage which existed in towns was usually for the rain-water and surface-water alone, and the inhabitants were strictly watched to prevent their passing any sewage-matter into these drains. The introduction of the water-closet, however, gradually so increased the water which overflowed from the old cesspools that it was impossible to prevent such overflows, and systems of drainage were designed to carry off the whole, both sewage and rain-water. A very composite system of drainage then arose. Generally the bed of some stream or natural rivulet passing through the town was covered over, and the whole filth passed into that with the rainfall of the district. This soon was found unsatisfactory, because the flood-waters of the stream were not to be trusted to keep the channel clean; and so the filth remained festering underground, giving off deadly gases in the midst of the population. The arrangement which succeeded to that system was to plan large drains for the rain and surface-water, and sewage; and still keeping the idea of the size of the bed of a natural stream before them, engineers thought it necessary to make all the main drains large enough for a man to pass through them and keep them clean. Because of the vast quantity of sand and grit occasionally washed off the streets, something might be said in defense of this system. Vast numbers of these great main sewers still exist. Into these sewers all the smaller house-drains were to enter, and the surface-water through street-gratings as well. The ordinary water used for domestic purposes, and the occasional rainfalls, were relied upon to flush those large main sewers; but their great size made this an exceedingly difficult and uncertain process, and they, in fact, became only cesspools elongated. In dry weather, the filth was retained in them to such an extent that, after heavy rains, chemical analysis showed that the water discharged contained frequently 20 times more of human fecal matter per gallon than in dry weather. This state of matters, added to the fact that long-continued dry

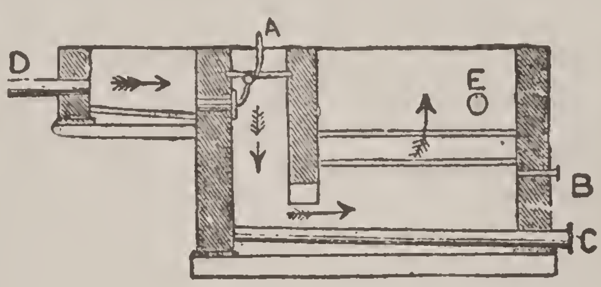


Fig. 4.

The whole sewage-matter enters at D; flows in the direction of the arrows; the solid matter becomes arrested in the bottom chamber, while the liquid rises and passes off at E through filtering beds. By opening a tap at B, the liquid in the tank or filter can be drawn off; and by opening that at C, the solid matter can be removed. The whole must be water-tight and air-tight. A is a valve for shutting the pipe during cleaning.

weather was always attended by increase of deaths from typhus and other fevers, clearly showed that something more must be done. A further step was then taken by sanitary engineers. The idea of men passing through the drains was set aside, and the smallest possible drains were constructed, until these have arrived at such dimensions as an 18-inch main drain for a town of 10,000 inhabitants. The rainfall was still to be relied on to a certain extent for flushing purposes, but a supplementary assistance was to be given at some points by flushing with water from the ordinary regular supply of the town. As these smaller drains were not sufficient to carry off all the surface and rain water, as well as the sewage, overflow weirs have been provided at certain points, where the excess must go over, and pass away into some other channel. This is the system now most in use; but in the opinion of many sanitary engineers it, in its turn, must give way to something better, viz.—a double system of conduits: one for sewage, the other for rainfall. The necessity of dealing with the sewage at the main outfall, and the utilization of it for agricultural fertilization, while, in nine cases out of ten, pumping must be employed to lift the sewage of a town at the discharging point for such a purpose, have gradually forced the conviction that the sewage and household-water must be kept quite distinct from the surface-water, subsoil-water, and rainfall; but no system is absolutely best: local conditions determine the most suitable mode of sewerage.

The outfall of the sewage-drain, and subsequent disposal of the filth, are in reality the first things to be considered. Hitherto, engineers in general have taken the nearest stream, and polluted it to such an extent that lawsuits, nuisances, and diseases have been the result. Fever of the worst class is certain to follow the drinking of water tainted in this manner; and multitudes of streams have been injured from this cause.

Again, where the sewage has been emptied into the sea, tide-locked drains are objectionable, and the sewage when mixed with salt water generally gives off more stench than ever. We may briefly say that all attempts at purification of sewage by chemical processes have hitherto failed, and, as far as our present knowledge goes, are not to be trusted. The utilization of the sewage on the fields by irrigation is, therefore, the true solution of the problem, and we must arrive at the simplest, cheapest, most certain, and most perfect system of accomplishing this. When sewage and rainfall all go together in the same drains, as they do in all the older systems, all is uncertainty; while, when the two are separated, rain and surface-water can be discharged at any point into the natural water-courses of the country, and a fixed quantity of sewage, with household and flushing water, would be passed to the main outlet, to be there dealt with. The opponents of this system say that it is too expensive and troublesome to plan; that it is unnecessary, as it is sufficient if engineers provide for the dry-weather flow of the sewage, and use that for irrigation; and that, when the overflows come into action in floods, the whole is so much diluted that no harm is done to any one. On the other hand, the advocates of this double system of drainage have proved the total separation of the two the most sanitary system, because the street-gratings and rain-water pipes, which at present let down the rain-water into the sewage-drains, act as so many ventilating shafts, and discharge the stench in the midst of the inhabitants, while under a separate system the sewage-pipe would be entirely sealed up, and ventilated only at selected places where it could safely be done; that the rain-water as a flushing power ought to be entirely discarded, as it fails in dry weather, when it is most wanted; that in wet weather and in winter, when the discharging of the sewage on to the surface of land is carried out, the great quantity of water sent down through the drains by the present system is agriculturally a serious injury; that when pumping has to be employed for lifting the liquid for irrigation, as it is in most cases, all is uncertainty, and that no machinery can be economical and efficient under such circumstances, and that the planning of the irrigation also becomes difficult to manage, and irregular. With regard to the expense, it has been proved that, as the rain-water and surface-water can be discharged at the nearest point, all the drains may be much lessened in size and cost; and further, that the flushing-power of the water in the sewage-drains will be much more efficient, while the corresponding lessening of the expense in carrying out the process of utilization will completely compensate any additional outlay in laying the drains in towns. If we take the case, which is common, of a population of 10,000 people on a sq. mile, the first-mentioned system, where rain and sewage water go together, would require pumping machinery in dry weather of, say, 10 horse-power, to lift the liquid; and it would further be necessary, for wet weather, to have in reserve a lifting power of 300 horses; while, on the separate system, where the sewage alone would have to be dealt with, the 10 horse-power engine would be regularly and constantly employed, and its work would be almost entirely confined to the daytime, whereas the other must be ready at any time and for every emergency. The system of sending sewage and rain-water together has been hitherto adopted almost universally in towns; but except in one or two cases where gravitation has been available to utilize the discharge from the drainage, all engineers have failed to prevent the pollution of rivers; and it is obvious that something else must be tried, as that cannot be permitted much longer. The system of separating the sewage and rain-water has been carried out in several instances on a large scale, with satisfactory results.—See below, *Liernur's System of Sewerage.*

4. *Utilization of Sewage.*—The whole sewage of a house or town having been conveyed away in the manner above described, the next important step is to know what to do with it. If possible, it is desirable to add to the productiveness of the soil, so as to compensate in some degree for

the constant supply which human life draws from that source.

The great volume of liquid sewage—not less than 25 gals. per head, and in many cities much more—has been a serious obstacle to its utilization; while also the vast quantities of road-grit and the great gluts of rain that come down with the sewage when there is only one system of drains in a town, have upset all arrangements and calculations. Many attempts have been made to precipitate all the valuable qualities of the sewage by impregnating the whole with milk of lime; but it is found that the precipitate ('sludge') contains only a small portion of the agricultural constituents; besides, a great quantity of sand is precipitated at the same time: hence the product is almost worthless as manure. There are several other chemical processes for treating sewage: of these the 'A B C' process appears to give best results. An emulsion of clay and coke-dust with a little blood is first mixed with the sewage, then a precipitating solution of alum is added, and the mixture is allowed to settle. The effluent liquid is clear, containing none of the insoluble constituents, but retaining a portion of the soluble. The precipitate 'native guano' is of considerable value as a manure; but the clear liquid is not fit to enter streams.

In exceptional cases, irrigation of land by gravitation has rendered the process a simple one, because the whole has been poured over the land with excellent results; but in general we must look to pumping as being necessary in by far the greater proportion of towns; while in the exceptional cases the results would probably have been better still if the strength of the sewage had been more concentrated. Agriculturally speaking, any dilution above 25 gals. per head of the population is not desirable, but is injurious and expensive to distribute; while, again, human fecal matter is too strong to be applied to land unless diluted in at least about 10 gallons of water. The Chinese teach us an important lesson in this respect: they place all the solid matter, when they remove it from the towns, in small wells in their fields, and then take a scoopful and mix it in 10 or 12 times its volume of water before they apply it to their crops. If any one attempts utilizing sewage when mixed with rain-water, and has to pump the whole all the year through, he will find himself in endless difficulties.

Presuming, then, that we can arrive at a fixed quantity of 25 gals. per head of the population, or what may be taken as the dry-weather flow of the drainage from a town, the first step is to pass the whole through a strainer, so that all materials may be intercepted which will be likely to interfere with the pumping, or to choke the smaller pipes used for irrigation. This is necessary, also, because in its unstrained state we cannot depend on sewage going down and then up again, and so passing over a valley; and the sphere of operations thus becomes more limited. Great part of the solid matter can also be removed by this process, and common house-ashes are the best mixing and deodorizing material to facilitate carrying away the stuff.

SEWERAGE.

For application of sewage to agricultural use, a piece of land should be sought with a slope, if possible, of one ft. in 30 at least, and the filtered liquid, which will be full of strength, conveyed either by pumping or gravitation to the highest point of that land. Iron pipes should not be used, if others are possible; and when the land is very flat, it must be ridged and levelled. From the highest point of the land selected, the liquid must be conducted by open channels or through common drain-pipes laid on the surface to all the different points where it is wanted, and utilized for irrigation. The land adopted should be moderately porous, and then for every 100 people an acre should be allowed, though this varies much according to the nature of the soil. The land must be thoroughly drained and prepared. When the farm is properly laid out and carefully managed, the effluent water can safely be directed into any stream from which water-supply is drawn. The best crops to be grown are Italian rye grass, with alternate crops of vegetables, such as potatoes, cabbages, rhubarb, mangold. All these will thrive on the liquid. Milch cows thrive remarkably well on this grass, and it has been proved by chemical analysis that the milk is of the best quality, while the vegetables are quite wholesome.

The Mass. Board of Health issued (1891) a report on the subject of treatment of sewage by land filtration, in which they maintain that sewage can be more perfectly filtered through open sand than through sand covered with soil. The soil prevents free access of air, and may thus entirely prevent purification of the sewage. Yet, by allowing periods of intermission, so as to permit the layer of soil to dry, a high degree of purification can be attained. Filtering areas of sand covered with soil are much increased in efficiency by digging trenches in the direction of a slight incline and filling them with coarse sand, the upper layers of which should be renewed once a month. Bacteriological experiments showed that when the filters were in proper working order the number of organisms in the effluent from the filters were never more than two per cent. of those in the raw sewage, and the board think this result may be much improved. Fine sand was found to make a very good filter, purifying sewage at the rate of 9,600 gallons per acre per day, the number of bacteria in a cubic centimetre of the sewage being reduced from 591,000 to 2,000, and the ammonia to a quarter of one per cent. of the quantity in the unfiltered fluid. Garden soil made a very poor filter, but a mixture of fine sand and gravel gave extremely good results, as 25,000 gallons would be purified by it per acre per diem in winter, and 42,000 gallons in summer; the bacteria being reduced from 350,000 per cubic centimetre in the sewage to 14,000 per cubic centimetre in the effluent. Peat was totally inefficient. A filter of sand and loam gave good results as far as purity was concerned, but the rate of filtration was only one-third as great as that of the sand-and-gravel filter.

In regard to agricultural application of sewage, it must be said that until we arrive at quantities, qualities, and proportions scientifically fixed—a matter of extreme difficulty as involving so many diversities of local circumstance—no principles can be laid down which can be trusted for economical results in all or a great variety of cases. It remains a question, certainly in many cases, whether money invested in schemes for utilization of sewage will pay adequate return. The uncertainty attending the dilution of the sewage; the necessity of making the earth take it at all seasons; the distance that the liquid has to be pumped—have in experience been found difficult elements in the problem.

The LIERNUR SYSTEM is a pneumatic system devised by Capt. Liernur for dealing with town sewage. It has been in operation several years on the continent of Europe; and Amsterdam, Leyden, Prague, Dordrecht, St. Petersburg, and some other towns are now either partly or wholly drained on this plan. A town so drained is divided into districts of 250 to 1,000 acres; and each of these districts is again divided into small sewage areas from 10 to 50 acres, according to local circumstances. These small areas have each an air-tight cast-iron tank, from which extend along the several streets air-tight pipes of the same material, 5 inches in diameter, and independent of each other. The closets of the houses are connected by branches with these pipes.

An air-pump engine, or more usually two or three of these steam-engines, are placed in some central station, and in the under portion of the building are air-tight iron reservoirs, in which a vacuum of about three-fourths atmospheric pressure is maintained. Pipes, also air-tight, called central pipes, connect these reservoirs with the street tanks. Like the outer series, these are five inches in diameter, and each pipe has two connections with its street tank by one of which only air can be sucked out; but the other dips into the well of the tank, thus enabling its contents to be removed by suction to one of the central reservoirs. When a vacuum is made in one of the street tanks, the contents of the closet pipes are drawn toward it; and on a second vacuum being created, the charge is drawn into it. This tank is in due time emptied into a central reservoir by exhausting the air in the pipe connecting them. Though no water is used for flushing, it is found that the fecal matter is reduced almost from the first to the consistency of thin pulp by the atmospheric pressure. Now as it is impossible to propel liquid any great distance along a horizontal tube simply by air-pressure—the air-column always breaking through and destroying the vacuum—the pipes require to be set at inclines varying from 1 in 5 to 1 in 250 according to circumstances. This admits of a series of vertical risers being formed from which the liquid matter can never be altogether removed; therefore these form a complete lock-off of one gradient from another, so that the vacuum cannot be destroyed. The residual liquid in these risers corresponds to the left quantity of water which a pump can never completely remove from a receptacle.

When the apparatus is at rest, this minimum quantity of liquid matter arranges itself partly in the riser and partly in the lower end of the sloping pipe.

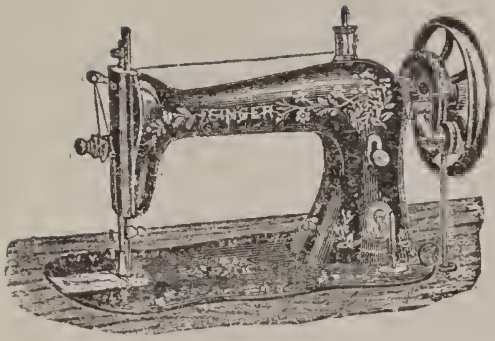
To show what takes place when there is a much larger amount of excreta to remove in one direction than in another, we may take the case of two branches from one main pipe, each 100 ft. long, the gradient 1 in 100, and each having a riser of one ft. One of these pipes may have to deal with a single house producing only one foot of fecal matter; the other may be connected with a barrack producing 100 times as much. 'We have, therefore, in the barrack pipe a mass filling both pipe and riser, and ready on the slightest force to discharge into the main or street pipe. On the other hand, in the branch pipe of the single family there is the minimum quantity collected at the foot of the riser. The sucking action is now put in operation in the main pipe. The pressure of the atmosphere begins to act, and the barrack pipe rapidly discharges into the main pipe, while the smaller quantity is simply climbing up the riser, and before it has got to the top of the riser, to be in a position to discharge, all the surplus quantity in the barrack pipe is gone, and that which is left is simply equal to that minimum which cannot be withdrawn. In this way the fullest pipe always begins to discharge first, the next more full waiting for it, and so on, until the minimum is reached, when simply air breaks through.'

During the day the air-pumps maintain a vacuum in the central reservoirs and throughout the whole extent of the central pipes connected with them. Patrols of two men each visit the district tanks, one of whom, by opening a valve, makes a tank communicate with the central pipes, and so exhausts the air from it. He then shuts the valve, and the second man immediately opens another, which allows the vacuum to act on one of the street pipes and its branches. A second, third, and fourth street pipe is dealt with in the same manner—the vacuum meanwhile being frequently renewed in the tank—till all the sewage in a district is collected and transferred to a central reservoir.

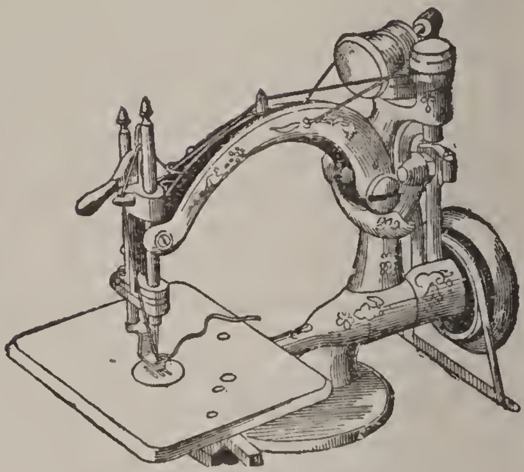
The pneumatic system of Liernur admits of ordinary water-closets being used. As, however, the water has afterward to be got rid of, he prefers, on the score of economy, a form of closet devised by himself which is used without water. It has no movable mechanism at all. The space into which the excreta falls is one arm of a short bent tube or siphon trap discharging into a soil-pipe. Each new deposit by its own weight forces out the former one, and there are special arrangements for ventilation.

Capt. Liernur aims at making the sale of the fecal manure cover the working expenses of the system. The process, or at least one process, by which he converts the sewage material into a marketable manure, is mainly as follows: Mixed with a little sulphuric acid, it is placed in a large boiler through which pipes pass, and through these pipes waste steam, after being superheated, circulates, by which a rapid boiling takes place. The material is

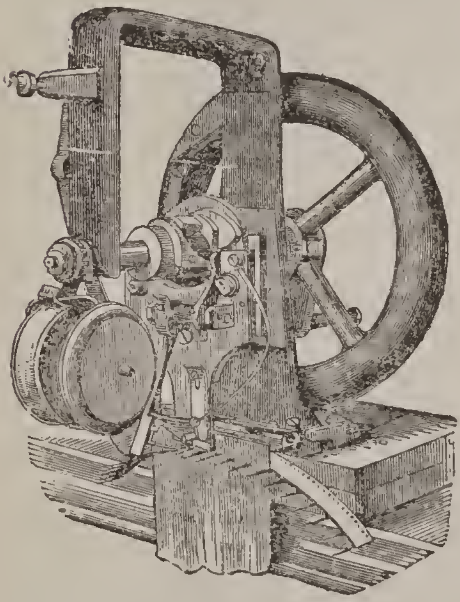
PLATE 6.



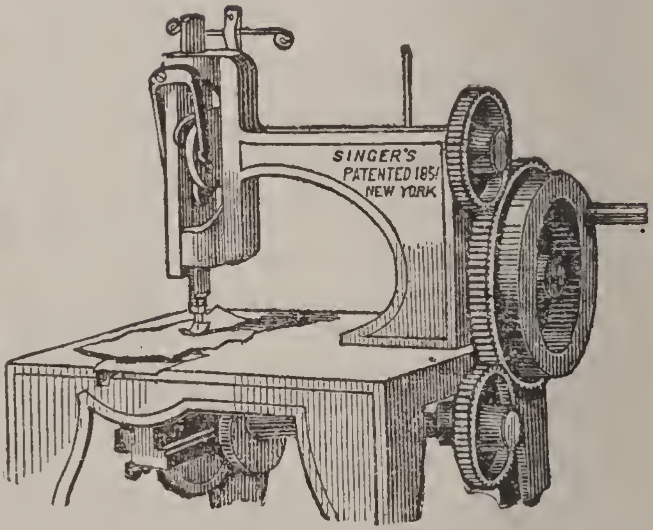
Singer Oscillating Shuttle Machine.



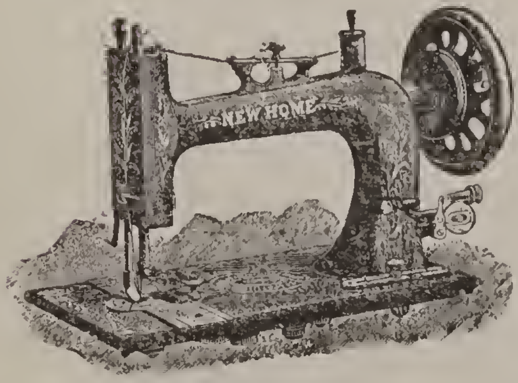
The Wilcox and Gibbs.



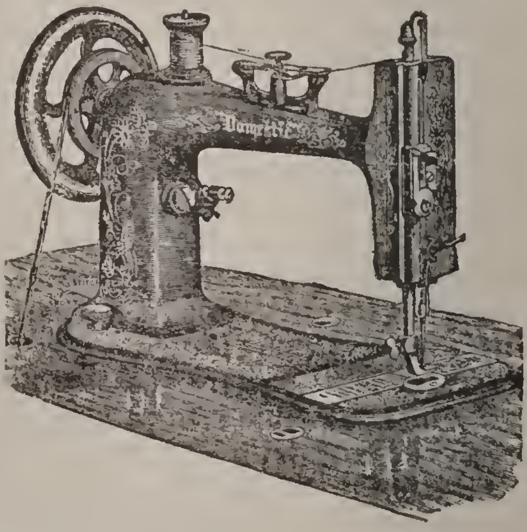
The Original Howe Machine.



The Original Singer Machine.



The New Home.



The Domestic

afterward transferred to a trough in which a long hollow drum of thin metal, heated internally, revolves. The drum takes up and dries a thin layer of the manure, which is scraped off by a fixed knife and sold under the name of *poudrette*. It contains 7 to 10 per cent. of ammonia; and it is affirmed that this method of converting the liquid manure into a dry powder is highly remunerative.

Where this system is adopted, the mere water-drainage such as that required for rain, waste water of houses, and the like, is provided for by separate drains formed of earthenware pipes, but much smaller than pipes through which all kinds of sewage pass. Existing sewers in a town may be used for this purpose.

SEWING-MACHINE: one of the most important of modern inventions. The earlier inventors tried to imitate hand-sewing, but as this proved impracticable, because of the wearing out of the thread, an attempt was next made to imitate the crochet-stitch by machinery. Charles F. Weisenthal took out a patent in England, 1755, June, for a needle pointed at both ends, with an eye in the middle suitable for sewing-machines: a patent was taken out by Robert Alsop, in England, 1770, March, for embroidering with shuttles in a loom: 1804, May, John Duncan took out a patent for machine embroidery with hooked needles attached to a horizontal bar, an invention further perfected in Heilmann's machine. A patent was taken out by Thomas Saint, 1790, for a machine 'for quilting, stitching, and making shoes, and other articles by means of tools and other machines.' The machine patented by a Frenchman 1830 was used in Paris 1841; in a much improved form it was patented in France 1848, and in the United States 1850. Although Walter Hunt of New York is said to have made a machine 1832–34 which produced the lock-stitch, yet it is generally conceded that Elias Howe (1819–67), who patented his machine 1846, is the originator of the lock-stitch machine. His machine has formed the basis on which numerous improvements and modifications have been made by other inventors. Isaac M. Singer, founder of the Singer Manufacturing Company, and A. B. Wilson, are honorably connected with the early history of the machine. The practical utility of the sewing machine had now begun to be recognized, and led to its manufacture by several firms. Elias Howe, conceiving that his patent was infringed, successfully established his rights of priority of patent in the courts of law, and the royalty which he received from the various manufacturers, and the success of the Howe Company, made him wealthy. The use of the sewing-machine is now co-extensive with modern civilization, and the number of machines annually manufactured is immense.

The chief improvements on the original lock-stitch machine are: 1. *Machines which sew with one thread:* of which one kind makes the *through-and-through* or *shoemaker's stitch* (fig. 1), the thread being held and pushed through with pincers, one pair on each side of the material to be sewn. The needle, *a*, is pointed at each end, and, being pushed through by the pincers on one side, is taken hold of by the corresponding pair on the other, and the thread is thus pulled through forward and backward. Only a small length of thread can be used by this machine; hence it is of limited application.—2. Another single-thread machine makes the *running-stitch* (fig. 2). In this, the needle, *a*, is stationary, and receives a continuous supply of thread from a reel, *b;* the two small-toothed wheels are so arranged that their teeth, pressing into one another, crimp the two pieces of cloth, and push them forward against the point of the needle, which, as it becomes filled, is relieved by the operator, who keeps drawing the sewn cloth off at the eye end of the needle This machine answers admirably in cases where loose tacking is required. It is the invention of an American of the name of Bostwick.—3. The *chain* or *tambour stitch* is also a single-thread stitch (fig. 3), the machine for which was invented by a Frenchman named Thimmonier, 1848: in this, the thread is looped upon itself by means of a curved shuttle after it has passed through the cloth. This kind of stitch, though very useful for some kinds of work, is easily pulled out.—4. Fig. 4 represents Wheeler and Wilson's S.-M., another American invention, which has acquired very great reputation. It is a double-thread machine, and besides the vertical eye-pointed needle has a curved shuttle or hook (shown in fig. 5), working below, with a revolving reel (shown separately in fig. 6) inside its curve. The reel is of metal, each side being con-

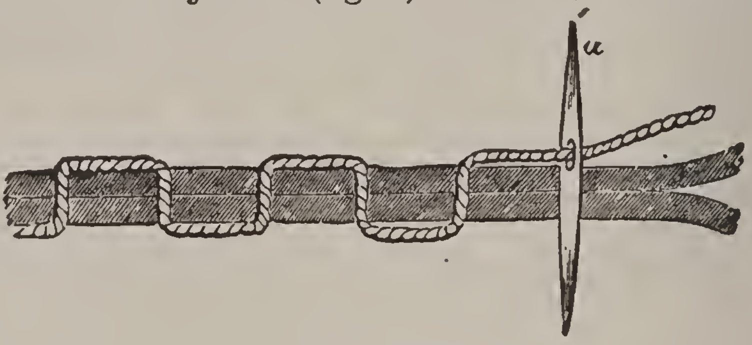


Fig. 1.

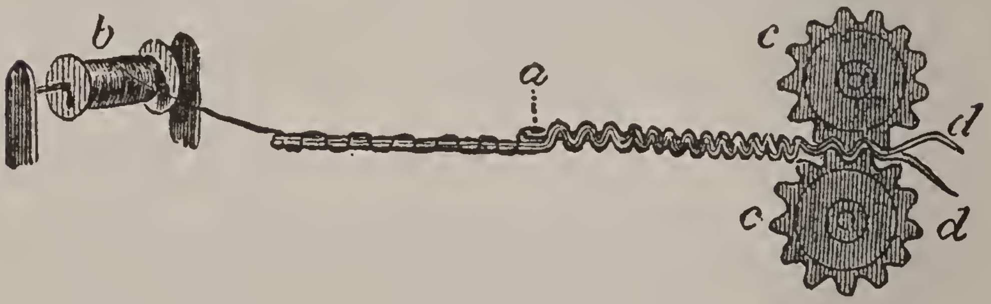


Fig. 2.

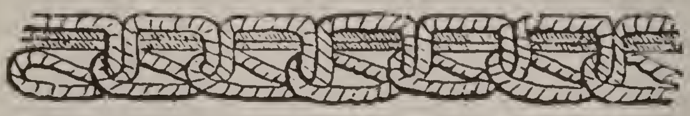


Fig. 3.

vex externally; and so adjusted on the axle that the edges are so near together as to admit only one thickness of the thread to pass through. It fits easily within the nearly circular hook, and gives off its thread as required. The thread passes partly round the outer edge of the hook upon a slightly grooved bevel, which forms a loop, and passes it between the needle and the thread which it carries with it in descending; the loop is held in position as the needle ascends, and the cloth being moved on, the next descent

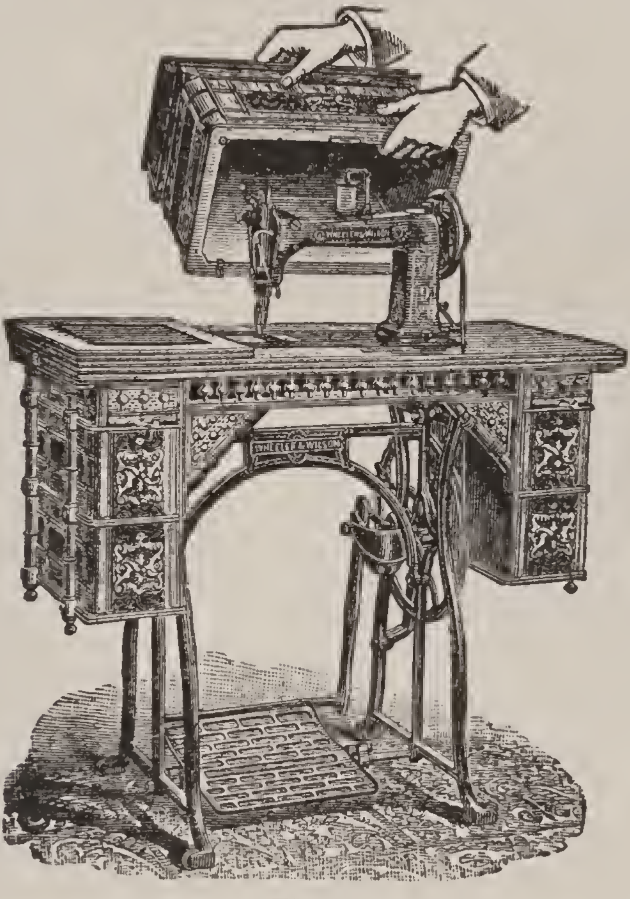


Fig. 4.

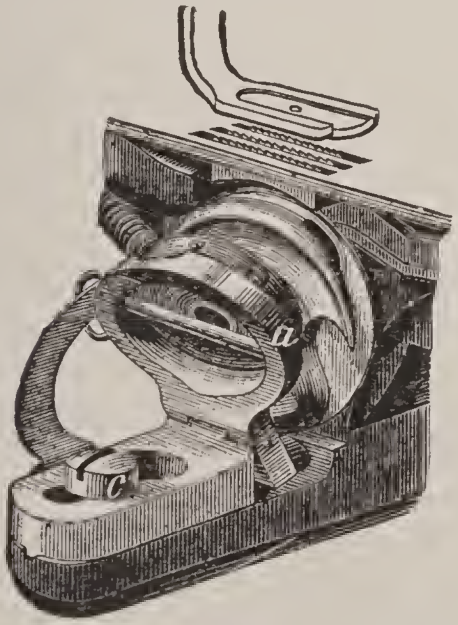


Fig. 5.

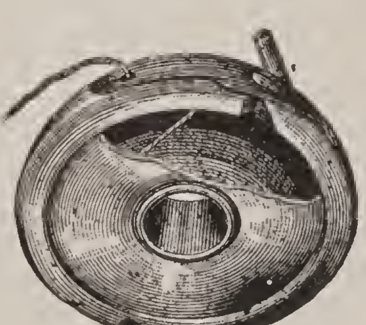


Fig. 6.

of the needle takes it through the loop and receives another below it, which renders the first one tightly locked, as in fig. 7. For tailoring and dressmaking generally, this kind of machine is at present unrivalled, both for efficiency of work and for the neatness and finish of the machines made for private use.

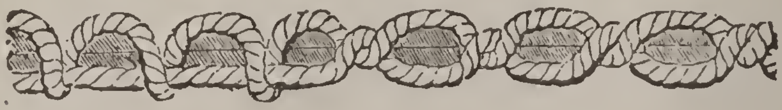


Fig. 7.

The more prominent types of S.-M. now in use include: 1. The running-stitch or Bostwick machine, for special work only, as in tacking material temporarily together; 2, the rotating-curved hook double thread machines, such as the Wheeler and Wilson above described; 3, the oscillating-curved hook double-thread machine, one type of Singer; 4. the single-thread chain-stitch machine, using a rotating curved hook under the feed-plate to form the stitch, the Wilcox and Gibbs representing this class; 5, the double-thread shuttle machine, in which the lower thread is carried in a regular shuttle under the feed-plate—the shuttle may work across the line of sewing, or in the same direction, as in the Domestic and modern Singer. Another distinctive feature of division is the adoption of a straight needle with parallel motion, or of a curved needle working in the arc of a circle, to whose contour it is bent. The straight-needle machines now decidedly predominate.

The most varied forms of attachments and of special styles of machines have been invented, and an immense number are now in use. As an illustration of the variety introduced into even the stitches, the different varieties now aggregate about 70 in number.

SEX, n. *sĕks* [F. *sexe*, sex—from L. *sexus*, a sex, male or female—perhaps from L. *seco*, I cut, or akin to Gr. *tekos*, offspring, progeny: Sp. *sexo*]: the distinction between male and female; applied to women by way of emphasis; in *bot.*, the structure of plants corresponding to sex in animals. SEX'LESS, a. *-lĕs*, without sex. SEX'UAL, a. *-ū-ăl* [mid. L. *sexuālĭs*, sexual]: pertaining to the sex or the sexes. SEX'UALLY, ad. *-lĭ*. SEX'UAL'ITY, n *-ăl'ĭ-tĭ*, the state or quality of being distinguished by sex. SEXUALIZE, v. *sĕks'ū-ăl-īz*, to distinguish into sexes; to personify. SEX'UALIZING, imp. *-ī-zĭng*. SEX'UALIZED, pp. *-īzd*. SEX'UALIST, n. *-ĭst*, one who adopts the Linnæan system of botany. THE SEX, women in general. SEXUAL SYSTEM, in *bot.*, the system of the naturalist Linnæus, founded upon the character of the organs of reproduction in plants, or their apparent absence.

SEX, *sĕks* [L. *sex*]: a prefix signifying six.

SEXAGENARIAN, a. *sĕks'ă-jĕ-nā'rĭ-ăn* [L. *sexagenārĭus*, sixty years old—from *sexagēnī*, sixty each; *sexagin'ta*, sixty: F. *sexagénaire*]: being 60 years old: N. a person aged 60. SEXAGENARY, a. *sĕks-ăj'ĕ-nĕr-ĭ*, designating the number 60: N. something composed of sixty.

SEXAGESIMA, n. *sĕks′ă-jĕs′ĭ-mă* [L. *sexages′ĭmus*, sixtieth—from *sexagin′ta*, sixty: F. *sexagésime*]: second Sunday before Lent, being about 60 days before Easter. SEX′AGES′IMAL, a. *-ĭ-măl*, pertaining to the number 60; computed or proceeding by sixties. SEXAGESIMAL FRACTIONS, fractions the denominators of which proceed in the ratio of 60: called also ASTRONOMICAL FRACTIONS: see SEXAGESIMALS.

SEXAGES′IMALS: mode of arithmetical calculation introduced by the ancient Greek astronomers, especially by Ptolemy (q.v.), into astronomical and geometrical reckoning. It was founded on the division of the circle into 360 parts, and the radius being nearly $\frac{1}{6}$ of the circumference, was considered to contain 60 of these parts or degrees. Continuing the same mode of subdivision, each degree (°) on the radius was divided into 60 minutes (′), each minute into 60 seconds (″), and thirds (‴), fourths (⁗), etc., followed in the same relation to each other. Addition and subtraction are not altered in this method; but multiplication, division, and the extraction of roots are altered to a considerable extent. Multiplication, the most used of these three operations, was carried on in the descending scale, as in the following example, where $\lambda\alpha^\circ\ \delta'\ \kappa\zeta''$ is to be multiplied by $\kappa\theta^\circ\ \iota\eta'\ \nu\delta'$, or (substituting Arabic numerals) 31° 4′ 27″ by 29° 18′ 54″:

$$\begin{array}{rrrrr}
31^\circ & 4' & 27'' & & \\
29^\circ & 18' & 54'' & & \\
\hline
899^\circ & 116' & 783'' & & \\
 & 558' & 72'' & 486''' & \\
 & & 1674'' & 216''' & 1458'''' \\
\hline
899^\circ & 674' & 2529'' & 702''' & 1458''''
\end{array} = 910^\circ\ 56'\ 21''\ 6'''\ 18''''$$

Here, each of the three numbers, 31, 4, 27, is multiplied by 29; the same three by 18, and the results placed in the line below, one step to the right; and again by 54, and the results placed another step to the right. This arrangement proceeds on the principle that the product of degrees by minutes gives minutes; of minutes by minutes, seconds; of minutes by seconds, thirds; and, in general, the denomination of a product is indicated by the sum of the marks superposed on the two factors. The columns are added and rearranged by Reduction (q.v.). This system, though clumsy and intricate, was a great improvement, as regards facility and accuracy, on the former Greek method; and so much was it admired that succeeding geometers founded on it a complete system of general calculation, and a work on sexagesimal computation was written by Barlaam, who died 1348. The terms minutes, seconds, thirds, etc., here employed denote only sixtieths, sixtieths of sixtieths, etc., and *have no other signification;* further, that the degrees, minutes, and seconds in the multiplier are, for the time being merely abstract units and parts of units. The operation of modern arithmetic known as *duodecimal multiplication* is effected in the same way, the subdivisions being twelfths in place of sixtieths.

SEXENNIAL, a. *sĕks-ĕn'nĭ-ăl* [L. *sexen'nis*, six years old—from *sex*, six; *annus*, a year]: happening once in six years, or lasting six years. Sexen'nially, ad. *-lĭ*.

SEXT, n. *sĕkst*, or Sexte, n. *sĕks'tĕ* [F. *sexte*—from L. *sextus*, sixth; *sex*, six]: a division in the offices of the Rom. Cath. Church; devotions for the sixth hour of the day, or noon: see Canonical Hours, under Canon.

SEXTAIN, n. *sĕks'tān* [L. *sex*, six]: a stanza of six lines.

SEXTANT, n. *sĕks'tănt* [F. *sextant*—from L. *sextans* or *sextan'tem*, a sixth part—from *sex*, six: Sp. *sextante*]: in *math.*, the sixth part of a circle: instrument like a quadrant, but having an arc of only 60 degrees, or the sixth part of a circle, used at sea and by astronomers.—A *Sextant* is an instrument for measuring the angular distance of objects by means of reflection. The principle of its construction depends on the theorem, that *if a ray of light suffer double reflection, the angle between the original ray and its direction after the second reflection is double of the angle made by the reflecting surfaces*. Thus let A and B (fig. 1) be two mirrors perpendicular to the same plane, and inclined to each other, and let SA be a ray of light, which falling upon A is reflected on B, and reflected in the direction BC, then ACB is the angle between the original and finally reflected rays, and ADB is the angle between the mirrors. Now, as the angle of reflection is equal to the angle of incidence, the angle $SAF = BAD$, and $GBA = DBC$; but $EBC = BAC + BCA = (BAD + DAC) + BCA = (BAD + SAF) + BCA = 2\,BAD + BCA$; and EBC also $= EBD + DBC = EBD + GBA = 2\,EBD = 2\,BAD + 2\,BDA$; therefore $BCA = 2\,BDA$, which proves the truth of the theorem. The instrument of which this theorem is the principle is a brass sector of a circle in outline; the sector being the sixth part of a complete circle, for which reason the instrument is called a *sextant*. Fig. 2 shows the essentials of its construction; AMN is the sector whose curved side, MIN, is the sixth part of a circle; A is one mirror wholly silvered, placed perpendicular to the plane of the sector, and on, and in line with, the limb AI, which is movable round a joint at or near A; B is the other mirror, also perpendicular to the plane of the instrument, and silvered on the lower half only, the upper half being transparent; E is an eyelet-hole or small telescope. The graduation runs from N to M (on a slip of silver, platinum, or gold let

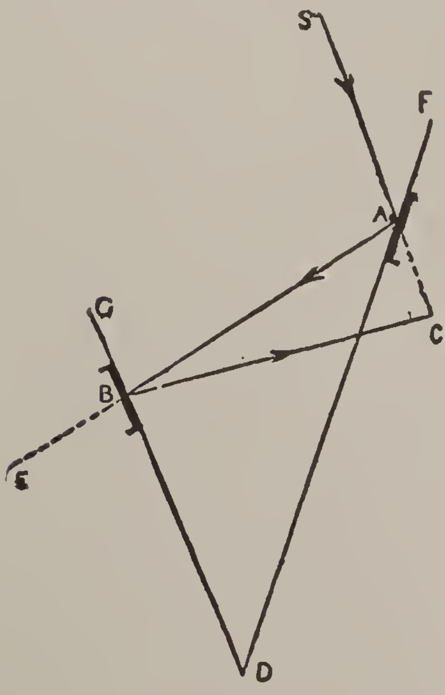


Fig. 1.

into the rim), and is so adjusted that when the movable limb is drawn toward N till the mirrors A and B are parallel, the index, which is carried at the foot of the movable limb, is opposite zero on the graduation. If we suppose that this zero-point is at N, it is evident that the angle between the mirrors is equal to the angle NAI; and again, if instead of graduating from 0° at N to 60° at M, which is the proper graduation for the sixth part of a circle, the graduation be made from 0° to 120°, that is, each half degree being marked as a degree, and similarly of its aliquot parts, then the angle NAI, read off by the index at I, will show at once the angle between the incident and finally reflected rays. The mode of using the sextant consists in placing the eye to the telescope or eyelet-hole, and observing one object directly through the unsilvered part of B, and then moving the index till the image of the other object reflected from A upon the silvered part of B, coincides with, or is opposite to the first object, then the angle, read off at I, gives the angle between the objects. For additional accuracy, a vernier is attached to the foot of the movable limb.

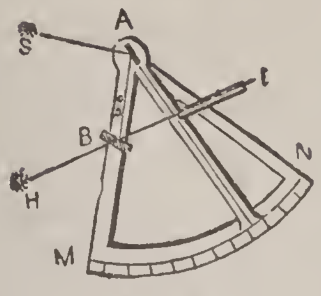


Fig. 2.

The sextant is capable of very general application, but its chief use is on board ship to observe the altitude of the sun, the lunar distances, etc., in determining the latitude and longitude. For this purpose, it is necessary to have stained glasses interposed between the mirrors A and B, to reduce the sun's brightness. These glasses (generally three in number) are hinged on the side AM, so that they may be interposed or not at pleasure. B is the glass through which the horizon is perceived, and has hence received the name *horizon-glass;* while the other mirror, from its being attached to the index-limb, is called the *index-glass.*

The sextant is liable to three chief errors of adjustment; 1° if the index-glass be not perpendicular to the plane of the instrument; 2° if the horizon-glass be not perpendicular to the plane of the instrument; and 3° if, when the mirrors are parallel (which is the case when a very distant body, such as the sun or moon, is observed directly through B, and found to coincide with its image in the lower part of B), the index does not point accurately to 0°, this last is called the *index error*, and is either allowed for, or is remedied by means of a screw, which moves the index in the limb AI, the latter being stationary. The first two errors also are frequently remedied by means of screws working against a spring, but in the best instruments the maker himself fixes the glasses in their proper position.—The *quadrant* differs from the sextant only in having its arc the fourth part of a circle, and being consequently graduated from 0° to 180°; the *octant* contains 45°, and is graduated from 0° to 90°; while the *repeating circle*, which is a complete circle, is graduated from 0° to 720°. A common form of the sextant is the 'snuff-box' sextant, circular in shape, and which, being conveniently carried in the pocket, is the form most used by land surveyors.

The idea of a reflecting instrument, on the principle of the sextant, was given first by Hooke about 1666; but the first instrument deserving the name was invented by John Hadley (q.v.) early in the summer of 1730, and a second, and much improved form, was made by him soon afterward. Halley, at a meeting of the Royal Soc., claimed for Newton the priority of invention; and 1730, Oct., a Philadelphian, named Godfrey, also asserted his claim as the original inventor; but that learned body decided that Newton's claim was unsupported by even probable evidence, and that Hadley's and Godfrey's inventions were both original, but that the second form (almost the same as the common sextant now employed) of Hadley's instrument was far superior to his first form and to Godfrey's.

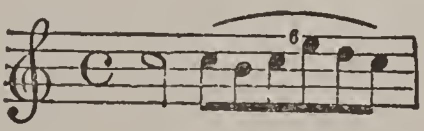
SEXTET, n. *sĕks'tĕt,* or Sextetto, n. *sĕks-tĕt'tō* [It. *sestetto*—from L. *sextus*, sixth]: in *music*, a composition for six voices or six instruments.

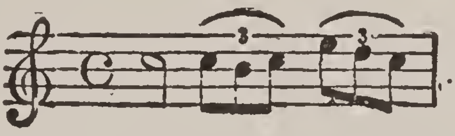
SEXTILE, n. *sĕks'tĭl* [L. *sextīlis*, sixth—from *sex*, six]: the aspect or position of two planets when 60 degrees or two signs apart.

SEXTILLION, n. *sĕks-tĭl'yŭn* [L. *sextus*, the sixth, and Eng. *million*]: in *Eng. notation*, a million raised to the sixth power, or a number expressed by a unit followed by 36 ciphers; in *Fr. notation*, represented by a unit followed by 21 ciphers.

SEXTO, n. *sĕks'tō* [L. abl. sing. of *sextus*, sixth]: volume formed by folding the sheets into six leaves each.

SEXTON, n. *sĕks'tŭn* [contr. from Sacristan (q.v.): OE. *sekesteyn;* F. *sacristain*]: *formerly*, the keeper of the sacristy, where the sacred vestments, etc., of a church are kept: now an inferior officer of a church or congregation, who prepares graves, attends to the burials, cleans the church, etc.; a gravedigger. Sex'tonship, n. the office of a sexton.—A *Sexton*, in England, is a parochial officer whose duty is to take care of the things belonging to divine worship, and to attend to interments in the churchyard. He sometimes holds the office also of parish-clerk. Women have occasionally been appointed sextons. In Scotland, the beadle performs similar duties.

SEXTUPLE, a. *sĕks'tū-pl* [L. *sextus*, the sixth; *plico*, I fold]: sixfold. Sex'tuplet, in music: when a note is divided into six parts instead of the usual division into four—e.g., a minim into six quavers, or a crotchet into six semiquavers—the group is called a sextuplet, and the figure 6 is generally placed above it. The proper sextuplet is composed of three groups, of two notes each, being, in fact, a Triplet (q.v.), with each of its notes subdivided into two:  But a group composed of two successive triplets is sometimes, though not very correctly, also called a sextuplet, and written as such, though it is more correct to divide it into its component two triplets, thus:



SEXTUS EMPIRICUS, *sĕks'tŭs ĕm-pĭr'ĭ-kŭs:* Greek philosopher in the first half of the 3d c.: b. Mytilene. His two extant works are a thesaurus of ancient skepticism, and were translated into Latin by J. A. Fabricius (1718; emended ed. pub. by Bekker 1842). The first, *Pyrrhoniæ Hypotyposes*, or Opinions, was named after the skeptic Pyrrho. The other, *Adversus Mathematicos*, attacks all the sciences, physical and metaphysical. He defines skepticism as a disposition to doubt everything beyond mere phenomena—which is precisely the re-vamped philosophy and vaunted wisdom of many in recent times. After Sextus, and his pupil Saturninus, ancient skepticism seems to have died a natural death. Sextus was a physician, nearly contemporary with Galen, but his medical writings are lost.

SEXUAL, SEXUALIZE, ETC.: see under SEX.

SEYCHELLES CO'COA-NUT, *sā-shĕl'*, or DOUBLE COCOA-NUT (*Lodoicea Seychellarum*): palm, whose fruit has some resemblance to a cocoa nut, though it belongs to a different tribe of palms, being allied to the Palmyra Palm. It is found only in the Seychelles Islands; and the fruit, wafted by the winds to the shores of the Maldive Islands, or found floating in the Indian Ocean, was long the subject of ridiculous fables, and is still an object of interest and curiosity, and as such one of the minor articles of commerce. The tree grows to the height of 50 or 60 ft., with a tuft of immense leaves. The wood and the leaves are used for a variety of purposes, like those of other palms. The 'cabbage' or terminal bud is eaten. The fruit is often 12 or 18 inches long, in shape like a melon, its outer husk green, the interior near the base divided into two parts, at first filled with a white sweet jelly, which changes into a white horny kernel. The shells are used for making vessels of various kinds, often beautifully carved and ornamented.

SEYCHELLES ISLANDS, *sā-shĕl':* archipelago of more than 30 isles, nearly in the centre of the Indian Ocean, between 3° 40'—5° 35' s. lat., and 55° 15'—56° 0' e. long.; resting on an extensive bank of sand and coral, and forming the most important of the dependencies to the colony of Mauritius. The principal are Mahé, Praslin, Silhouette, La Digne, Curieuse, St. Anne, Aux Cerfs, Frégate, Marianne, Longue, and Du Sud Est. Mahé, most considerable and populous of the group, and the seat of govt. is 18 m. long, and 3 to 5 broad. The islands are mountainous, often rising abruptly from the sea, and are clothed with most luxuriant verdure; one of the peaks, Mont

Blanc, in Mahé, having a height of 3,000 ft. The principal port is Victoria, on the n.e. side of the island of Mahé; its houses formerly were chiefly of wood; but now coral is universally employed. Coral is growing rapidly all round this group of islands. At Port Victoria, where the soundings were recently given at 7 fathoms, the coral has piled itself up to within 2¼ fathoms of the surface. In the neighborhood of Port Victoria is a beautiful church built of coral. Many improvements have been made in these small islands.

The S. were known to the early Portuguese navigators, who named them Isles de Mascarenhas; subsequently, the French renamed them Iles La Bourdonnais, and finally changed their appellation in honor of the Count Herault de Seychelles. They were first settled by the French 1756, who began cultivation of spices, under circumstances so favorable as to induce a belief in a lucrative competition with the more easterly colonies of the Dutch. The immunity of the S. from the hurricanes which periodically visit the neighboring seas rendered them peculiarly suited for this purpose, which, however, received a severe blow by the destruction of the spice-plants by the French occupants, to prevent their falling into the hands of the English 1778. The cultivation is now checked by insufficiency of labor. On the cession of Mauritius, the S. were finally taken into possession by Great Britain. The islands produce a large quantity of timber suitable for ship-building purposes; and the S. cocoa-nut, indigenous only in the S., and whose nuts, leaves, etc. are applied to a great variety of domestic purposes by the natives. Sugar is cultivated to a small extent. Cotton flourishes here, but its cultivation has declined since the abolition of slavery. The chocolate plant and vanilla are grown, and tortoise-shell is among articles of commerce.

Pop. (1901, May) 19,237, many of whom are employed in the ship-building yards and factories.—See Sir Edward Belcher's *Account of the Seychelles;* Owen's *Voyage of H.M.S. Leven and Barracouta;* Horne's *Report on the S. Islands* (1875); *Nature,* XIV.

SEYMOUR, *sē'mėr:* city in Jackson co., Ind.; on the Ohio and Mississippi, the Pittsburgh Cincinnati Chicago and St. Louis, and the Evansville and Terre Haute railroads; 59 m. s. of Indianapolis, 87 m. w. of Cincinnati. It is lighted by gas and electricity; contains 10 churches, public schools, 2 nat. banks (cap. $200,000), 1 state bank (cap. $40,000), and 2 daily and 2 weekly newspapers; has extensive railroad machine-shops, foundries, woolen and planing mills, flour-mills, and stave, hub, and spoke factories. Pop. (1890) 5,337; (1900) 6,445.

SEYMOUR, *sē'mėr,* Family of: family whose history is largely interwoven with that of England, originally settled at St. Maur—whence its name—in Normandy. Going over to England, the Seymours obtained lands in Monmouthshire as early as the beginning of the 13th c. They acquired estates at Hatch Beauchamp, Somersetshire, by marrying an heiress of the Beauchamps early in the

SEYMOUR.

15th c.—In 1497 the head of the family, Sir John S., was employed in suppressing the insurrection of Lord Audley and the Cornish rebels, and subsequently accompanied King Henry VIII. to his wars in France and to the Field of the Cloth of Gold Of the issue of this worthy knight, one daughter became wife of Henry VIII., and mother of Edward VI.; one son, Thomas, created Lord S. of Sudeley, became lord high admiral of England, and the second husband of Henry's widow (Catherine Parr), and ended his life on the scaffold, being attainted of high treason.—Sir John's eldest son, Edward, who held many high positions in the court of Henry, was created Lord S. of Hache, and Duke of Somerset 1546–7. He had been sent into France by Henry to settle the disputed question of the border of the English possessions there, and secured the confidence of the king so far that he was left by him one of his executors and one of the council of the young Prince Edward. He was subsequently made lord high treasurer, and eventually 'protector and governor of the king and his realms.' (See EDWARD VI.) His subsequent fall, after a two years' tenure of his almost regal power, by the influence of Dudley, Earl of Warwick and Duke of Northumberland, was followed by attainder of his honors, which was not reversed for more than a century.—The eldest son of the Protector by his second marriage, being created by Queen Elizabeth Earl of Hertford, married Lady Catharine Grey, grandniece of Henry VIII., sister of the unfortunate Lady Jane Grey—a marriage which entailed on him long imprisonment and a heavy fine.—His grandson, who succeeded him in the earldom of Hertford, also was sent to prison in the Tower of London for marrying Lady Arabella Stuart, cousin of James I. of England; but subsequently, taking conspicuous part in the royal cause in the civil wars, obtained in his own favor a reversal of his ancestor's attainder (see above), and 1660 took his seat in the house of peers as second Duke of Somerset, though the descendants of the first duke by his first marriage were then living.—He died 1675, and his ducal title passed to a cousin, on whose death it was inherited by Charles S., known in history as the 'Proud Duke of Somerset,' a nobleman whose style of living was ostentatious and haughty in the extreme, and who filled several high posts in the courts of Charles II., William III., and Anne. He married the heiress of the Percies, by whom he had a son, Algernon, 7th duke, who was created Earl of Northumberland, with remainder to his son-in-law, Sir Hugh Smithson, ancestor of the present Percy line.—On the death of this duke, a curious peerage case arose, the title being claimed by the descendants of the first duke by his first marriage, on the failure of the younger branch; and the attorney-gen. having reported in favor of the claim, Sir Edward S. took his seat in the house of peers as 8th duke.

SEYMOUR, *sē′mėr*, George Franklin, D.D., LL.D.: Prot. Episc. bishop; b. New York, 1829, Jan. 5. He graduated at Columbia Coll. 1850; and studied theology at the Gen. Theol. Seminary in New York. His first pastorate was at Annandale, N. Y., where he built a church and founded a training-school for candidates for the ministry, 1855–61. Then he was rector of churches in New York and Brooklyn till 1865, when he became prof. of chh. history in the Gen. Theol. Seminary. He was elected bp. of Ill. 1874, but the gen. convention of the Prot. Episc. Chh., then in session, refused to approve the act. Having been elected bp. of Springfield (Ill.) 1878, he was duly consecrated. He is classed as holding high-church views, and is a pronounced 'ritualist.' He has advocated a change in the style of his chh. from 'Protestant Episcopal Church' to 'Church of the United States.' He is author of *Modern Romanism not Christianity* (1888).

SEY′MOUR, Horatio, LL.D.: statesman: 1810, May 31—1886, Feb. 12; b. Pompey Hill, N. Y.; son of Henry S. He was educated at academies in his native state and at a milit. school at Middletown, Conn., and after studying law was admitted to the bar, but never practiced. He was milit. sec. to Gov. Marcy 1833–39, was elected by democrats to the state assembly 1841, was chosen mayor of Utica 1842, the following year was re-elected to the assembly, and soon became prominent in that body, was speaker of the legislature 1845, was candidate for gov. 1850, and was defeated by 262 votes, but was elected gov. 1852 by a majority of more than 22,000. His veto of a prohibitory law which was afterward passed and was declared unconstitutional, caused his defeat as candidate for gov. 1854. He declined the offer of a foreign mission 1857, was elected gov. 1862, and was severely criticised for his course in the bloody draft riots in New York 1863, July, as also for general lack of zeal in the national cause. In 1864 he received the thanks of a republican legislature for securing a correction of errors in the enrolment of the state. He presided over the democratic national convention 1864, was defeated for gov. in the same year, and against his judgment was nominated by the democrats 1868 for the presidency. He received 80 electoral votes, to 214 for Gen. Grant. He was interested in agriculture, and was prominent in developing the canal system of N. Y. He died at Utica, N. Y. Gov. S. was held in high honor as a leader and counselor in the democratic party.

SEY′MOUR, Truman: 1824, Sep. 25 – 1891, Oct. 30; b. Burlington, Vt.: soldier. He graduated at West Point 1846; served in Mexico: was asst. prof. at West Point 1850–53; fought the Seminoles in Fla. 1856–58, and aided in the defense of Fort Sumter 1861. He was in many important battles of the civil war, including those of Malvern Hill, South Mountain, and Antietam; led the attack on Fort Wagner 1863; captured Jacksonville, Fla., 1864; was taken prisoner at the battle of the Wilderness, and after his exchange led a division in the Richmond campaign and was present at Lee's surrender. He was made brig.gen. vols. 1862; received several brevets, including those of maj.gen. vols. and brig.gen. U. S. army; was mustered out of the vol. service 1865, Aug. 24, and was made major U. S. army 1866. After commanding at various points, he retired 1876, Nov. 1, and afterward removed to Florence, Italy.

SEYNE, La, *lâ sān:* a seaport of France, on the shore of the Mediterranean, dept. of Var, three m. s.w. of Toulon. Pop. 10,000.

SEZZE, *sĕt'sā*, or Sezza, *sĕt'sâ:* city of Italy, province of Rome. There are remains of a Cyclopean wall surrounding the rock on which it stands. Pop. 6,600.

SFAX, *sfâks*, or Sfakes, *sfâ'kĕs:* chief town and port of s. Tunis, 150 m. s. of the town of Tunis, with which it is connected by telegraph. There is trade in dates, cloth, olive oil, esparto grass, and jessamine and rose oil. Pop. 40,000, of whom 2,000 are Jews.

SFORZA, *sfort'sâ:* renowned Italian family, prominent in the affairs of Italy during the 15th and 16th c., swaying the destinies of n. Italy for many years, and allying itself with the first sovereign houses in Europe.—Its founder was a peasant of Cotignola, in the Romagna, by name *Giacomo*, or *Muzio* (sometimes combined by historians into *Giacomuzzo*) *Attendolo* (b. 1369), who deserted his trade of wood-cutting to become a 'condottiere,' and by his intelligence and courage rose to a high position in the band to which he belonged. Count Alberigo de Barbiano, founder of Italian 'condottierism,' bestowed on him, on account of his prowess, the name of Sforza (Ital. 'the forcer'); and such was his reputation among his comrades that he speedily found himself the independent leader of a band of condottieri, and offered his services to the king of Naples. Queen Joanna II made him constable of that kingdom, and in exercise of his office, he chased away the Aragonese, and others, who attempted to deprive her of her dominions; but dying 1424, Jan. 4, he left his devoted followers to the chieftainship of his natural son, Francesco S., then 23 years of age, who was as brave and enterprising as himself.—Francesco, as was the custom of the time, sold his sword to the highest bidder, and without the slightest scruple fought for or against the pope, Milan, Venice, and Florence. He invented an improved system of tactics, and it soon came to be taken for granted that victory was certain for the party which he supported. It was thus no great act of condescension in the Duke of Milan, the haughty visconti, to confer on him the hand of his daughter, Bianca, with Cremona and Pontremoli as dowry, and the promise of succeeding to the duchy itself. Meantime, S. took the march of Ancona from the pope (1434), added to it Pesaro (1443), and by a judicious combination of force and stratagem, obtained his elevation to the dukedom of Milan, 1450, Feb. 26, after the decease of his father-in-law. He solidly established his authority over all Lombardy, and several districts s. of the Po; acquired the esteem of Louis XI., who gave up to him Savona and Genoa: and after gaining the universal love of his subjects, died 1466, Mar. 8. Though uninstructed, he possessed considerable eloquence, and loved and protected letters. The successors to his power possessed few or none of his distinguished talents.—His son, GALEAZZO-MARIA S. (ruled 1466–76) was a tyrant, gloating over the torments of his victims, and a monster of debauchery, prodigality, and ferocity, without a single redeeming feature in his character. He was assassinated (Dec. 26) at the porch of the cathedral of Milan.—His son, GIOVANNI-GALEAZZO S. (ruled 1476–94) succeeded, under the regency of his mother, Bona of Savoy, who held the reins of government with a firm hand. But she was forced to give up (1480) her able coadjutor, Simonetta, to the vengeance of her brother-in-law, Lodovico Maria, surnamed 'the Moor,' from his dark complexion; and three days after Simonetta's execution, the ambitious Lodovico banished Bona herself, and assumed the regency. Finding the young duke in his way, Lodovico put him and his wife, Isabella of Calabria, in prison, and was immediately threatened with attack by the king of Naples, a danger which he attempted to ward off by giving his daughter, Bianca, with a dowry of 400,000 ducats to Emperor Maximilian I., and by stirring up Charles VIII. of France to assert his claims to Naples. Soon afterward, Duke Giovanni-Galeazzo died, poisoned, as some believe, by his uncle, 1494, Oct. 20.—LODOVICO-MARIA (ruled 1494–1500) obtained his investiture as duke, and becoming alarmed at the rapid progress of the French in Italy, he joined the league against them, and was rewarded for his perfidy by being driven from his duchy, which was seized by the troops of Louis XII. (1499). The following year he made an ineffectual attempt to regain possession, was made prisoner, and carried to France, where he died 1508. He possessed great talents, combined unfortunately with a low morality, which led him to value astuteness more than every other quality; but his encouragement of letters and of the fine arts, will preserve his name to posterity.—His eldest son, MASSIMILIANO S. (ruled 1512–15), regained the duchy of Milan after the reverses suffered by Louis XII., and with the aid of the Swiss steadily repulsed the various energetic attempts of the French to recover it; but after the battle of Marignan (1515), he abandoned his rights to the French for a pension of 30,000 ducats, glad to be free from the insolence and exactions of his allies, and the attacks of his enemies.—His brother, FRANCESCO-MARIA S., succeeded nominally to the Milanese after the battle of Pavia; but he was a mere puppet in the hands of Charles V., and on his death, 1535, Oct. 24, and the extinction of the main line of the house of S., the duchy was quietly swallowed up by Austria. The lords of Pesaro (extinct 1515), the Counts of Santa-Fiora, in Tuscany, still existing, and the Dukes of Sforza-Cesarini, descend from collateral branches of the family.

SFORZATO, ad. *sfŏrt-zâ'tō*, or Sforzando, *sfŏrt-zăn'dō* [It., forced, forcing]: in *music*, with force; louder than the rest—generally contracted *sf.;* and placed over or under the note which it relates to. Its higher degree is indicated by *sff*, or *sforzato assai*.

SFREGAZZI, n. *sfrā-găts'ē* [It. *sfreggare*, to rub—from L. *ex*, out; *frico*, I rub]: in *art*, a term applied to a mode of glazing adopted by Titian and other old masters for soft shadows of flesh, etc., and consisting in dipping the finger into the color, and drawing it once along the surface to be painted with an even movement.

SFUMATO, a. *sfû-mâ'tō* [It., smoky]: in *painting*, having the tints so blended that the outline is scarcely perceptible, the whole presenting an indistinct misty appearance.

SGRAFFITTO, a. *sgrâf-fē'tō*, or Sgraffiato, a. *sgrâf-fĭ-â'tō* [It., scratched]: applied to a kind of painting in which a ground of dark stucco is covered with a white coat, which last being partly scraped away, in forming design, the black ground appears and forms the shadows.

'S GRAVESANDE, *sgrâ-vĕh-sân'dĕh*, Willem Jakob van: 1688, Sep. 27—1742, Feb. 28; b. Holland. He was educated for the law, and afterward studied philosophy and other branches at Leyden and Leipsic; for 8 years was editor of the *Journal Littéraire*, for which he wrote valuable mathematical and philosophical papers, was prof. of math. and astron. in the Univ. of Leyden 1717–34, and from the latter year till his death prof. of philos. Among his works were *Physices Elementa Mathematica* (1720); and *Introductio ad Philosophiam* (1736).

SHABBY, a. *shăb'bĭ* [see Scab, *shabby* being a doublet of *scabby:* Dut. *schabben*, to scratch, to rub; *schabbe*, a scab; *schabbig*, shabby]: damaged or faded; torn or much worn, as a coat or other part of the attire; mean in appearance or conduct; contemptible; low; paltry; despicable. Shab'bily, ad. *-bĭ-lĭ*. Shab'biness, n. *-nĕs*, the quality of being shabby; raggedness.

SHABRACK, n. *shăb'răk* [Hung. *csabrag;* Turk. *tshâprâk*]: the cloth furniture of a cavalry officer's charger.

SHACK, n. *shăk* [Scot. *shag*, the refuse of barley (see also Shag and Shake)]: in *provincial usage*, shaken grain remaining on the ground after the gleaning is over; liberty of free winter pasturage from harvest to seed-time, according to ancient custom; a tramp or sturdy beggar: V. to shed, as corn in the harvest-field; to feed in stubble; to wander, as a vagabond. Shack'ing, imp. Shacked, pp. *shăkt*. To go ashack, to feed at large.

SHACKLE, n. *shăk'l* [O. Dut. *schackel*, the link of a chain; *schakelen*, to link together: Dan. *skagle*, a trace for a carriage: Sw. *skakel*, the loose shaft of a carriage—the original sense being 'a loose bond']: anything which confines or hinders the free use of the limbs, as fetters, chains, or handcuffs, usually in the plu.; that which obstructs or embarrasses free action: V. to fetter: to bind. Shack'ling, imp. Shack'led, pp. *-ld*

Common Shad of Europe.

SHAD: fish of the same genus (*Clupea*) as herrings and alewives, and belonging to the family *Clupeidæ* (q.v.). The best known is the AMERICAN or WHITE S. (*C. sapidissima*), formerly confounded with *C. finata* of England, from which it differs in not having the snout bifid. It has no spots on the sides, and the scales are large and silvery. The average weight is 4 lbs. occasionally 7 or 8 lbs, and there are traditions of 11 to 14 lbs. Its range is from the Gulf of St. Lawrence to Florida, and it has been introduced artificially into the Mississippi valley and Pacific coast rivers. There is occasional coastwise migration of this species, as shown by occurrence of the southern variety, with black-tipped fins, as far n. as Delaware Bay. But the most of the movements are from deep sea into rivers, regulated by a water temperature of 60° to 70° F., as the season advances, the spawning being in the higher temperature, while the half-grown S. do not ascend further when 60° is reached. The mature 'spent' adults sometimes remain; the young, 2 or 3 in. in length, leave late in autumn. The number of eggs in a ripe roe S. averages 25,000, rarely (in large individuals) reaching three or four times that number. The mature S., in fresh water, seems to take little or no food; hence it seldom responds to bait. This species is delicate and delicious food.—The HICKORY S. or MATTOWACCA (*C. mediocris*), known also as Long Island or Staten Island S., and in the south as the Tailor S., received the first name probably from its stripes, resembling those of the coarse cloth called 'hickory' in the south, where the fish has some esteem, and is often palmed off as White S. Occasional in n. markets in fall and winter, it is not much valued —The INLAND ALEWIFE or Skipjack (*C. chrysocloris*), mostly of western rivers and lakes, is sometimes called S., but is worthless.—The MUD-SHAD (*Dorosoma cepedianum*), otherwise called Winter S., Stink S., White-eyed S., is in Fla. known as Gizzard S., from the resemblance of its stomach to that of a fowl; it is eaten by negroes, and is sometimes made into guano; in the lake region it has a little sale when fresh, or split and dried, as 'Lake Shad.'

SHAD-BUSH (*Amelanchier Canadensis*): shrub or tree of the family *Rosaceæ;* same as June-berry (q.v.), and Service-berry: said to be named from its flowering at the time when shad appear in the Connecticut river, April and May. It varies much, the principal varieties being *botryapium*, 10–30 ft. high, with long drooping flowers; *rotundifolia*, with broader leaves: *oblongifolia*, the young branches white-downy; *alnifolia* (alder-leaved) of the west; and *oligocarpa*, with 2–4 flowered racemes, occurring in mountain swamps—the last three shrubs.

SHADDOCK, n: *shăd-dŏk* [after Capt. *Shaddock*, an Englishman who introduced it into the W. Indies], (*Citrus decumana:* see Citrus): large variety of orange—tree, which, like the other species of the same genus, is a native of the E. Indies, long cultivated in s. Europe. The tree is rather more tender than the orange. It is readily distinguished from most of its congeners by its large leaves and broad-winged leafstalk; it has very large white flowers, and the fruit is also very large, sometimes weighing 10, or even 14 lbs., roundish, pale yellow; the rind thick, white and spongy within, bitter; the pulp greenish and watery, subacid, and subaromatic. It is a pleasant, cooling fruit, used for preserves.

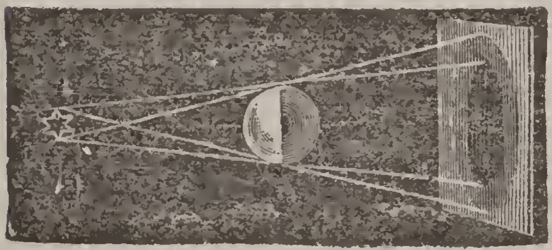
Shaddock Tree (*Citrus decumana*).

SHADE, n. *shād* [Goth. *skadus;* AS. *sceadu;* Dut. *schaduw*, shade: Ir. and Gael. *sgath*, shadow, shelter: Gr. *skia*, shade]: obscurity or darkening resulting from the partial interruption of the rays of light (see Shadow): gloom; any obscure or partially dark place; anything which intercepts light or heat: a glass cover for inclosing and protecting time-pieces and valuable ornaments, etc.; a screen; shelter; protection: the varying dark parts of a picture; a minute difference; a ghost; a disembodied spirit. Shades, plu. *shādz*, the lower regions; deep obscurity; Orcus. Shade, v. to screen from light or heat; to shelter; to protect; to paint with darker or more obscure colors; to darken; to obscure. Shading, imp. *shā'dĭng:* N. the act or operation of obscuring or darkening; the style in which such is done. Sha'ded, pp. Sha'der, n. *-dėr*, one who or that which shades. Sha'dy, a. *-dĭ*, sheltered, as from the heat of the sun; abounding with shades; *familiarly*, equivocal; suspicious. Sha'dily, ad. *-dĭ-lĭ*. Sha'diness, n. *-nĕs*, the state of being shady. Shadeless, a. *shād'lĕs*, having little or no shade. Shady side of forty, more than forty.

SHADOOF, or Shaduf, n. *sha-dôf'* [Arab. *shadûf*]: oldest-known contrivance for elevating water, being found represented on monuments as early as B.C. 1432. It is still very common along the Nile, being used for irrigation. It consists of a long stout pole or rod suspended on a frame at about one-fifth of its length from the end. The short end is weighted to act as a counterpoise of a lever, and from the long end a bucket of leather or earthenware is suspended by a rope. The worker dips the bucket in the river, and, aided by the counterpoising weight, raises it, and empties the water into a hole dug in the bank, from which a channel conducts it to the lands to be irrigated.

SHADOW, n. *shăd'ō* [see SHADE]: the shade or partial darkness of a definite form made on one side of a body, caused by a bright light falling upon the opposite side; that portion of space or a surface from which light is intercepted by some opaque body (see below): obscurity; shelter; a slight or faint appearance; something existing only in appearance: a close subservient companion or follower: type or mystical representation: used to denote a person or animal thin or emaciated to an extraordinary degree: likeness reflected from a mirror: V. to cloud or darken; to conceal under cover; to screen; to protect; to represent faintly or imperfectly; to paint in obscure colors; to represent typically. SHAD'OWING, imp.: ADJ. sheltering; representing by a faint or imperfect resemblance: N. gradation of light or color; a typifying. SHAD'OWED, pp. *-ōd:* ADJ. covered; clouded. SHAD'OWY, a. *-ō-ĭ*, full of shade; dark; gloomy; faintly light; unsubstantial. SHAD'OWINESS, n. *-ĭ-nĕs*, the state of being shadowy or unsubstantial. SHAD'OWLESS, a. *-lĕs*, having no shadow. SHADOW OF DEATH, the near and felt approach of death; a time of great darkness and trouble.

SHAD'OW: portion of space from which light is debarred by interposition of an opaque body. If the luminous body be too near, or too large to be considered a mere point, then each atom of the light-giving surface throws its own shadow independent of the others. There are thus in reality a multiplicity of shadows overlapping each other, and forming what in common parlance is 'a' shadow of the opaque body, darkest at those places where all the separate shadows overlap each other, and lighter as it gradually falls beyond the limits of more and more of these separate shadows: see PENUMBRA. The depth of a shadow depends from mere force of contrast on the intensity of the light around it; it depends much also on the nearness of the object, as compared with its size, to the surface on which the shadow is thrown; for the rays of light by their properties of reflection, refraction, and dispersion tend to bend 'round' the opaque object, and the increase of distance between an object and its shadow allows more scope for this action.


Shadow.

SHADRACH, n. *shăd'răk* [from *Shadrach*, one of the three on whose bodies the fire of the furnace, Dan. iii. 26, 27, had no power]: mass of iron in which the operation of smelting has failed of its intended effect.

SHADWELL, *shăd'wĕl,* Thomas: dramatic writer of some note in his day, though remembered only as the 'Mac-Flecknoe' of Dryden's satire: 1640–92; b. Norfolk, England. He was educated for the law, but deserted it, and betook himself to literature. His first comedy *The Sullen Lovers* (1668) had great success, and he continued from year to year to entertain the town with a succession of similar pieces, a complete edition of which was published after his death, 4 vols, 12mo. The immortality which these must have failed to achieve for him, he was fated to attain in a way somewhat less desirable. With Dryden he seems, in the earlier portion of his career, to have been on terms of friendly intimacy; but literary jealousies divided them, and the quondam friend became a favorite butt for the shafts of Dryden's deathless ridicule. Though S.'s works—hasty and careless as they are—exhibit lively talent and considerable comic force, nearly all that the literary world now knows of him is that 'Shadwell never deviates into sense.' It might a little console him, under the satire of his enemy, that he succeeded him in the post of poet-laureate, which in 1688 it became necesary for Dryden to resign. S. did not long enjoy it, however, as in 1692 he died, it is said of an overdose of laudanum, a drug in which he was wont to indulge himself.

SHAFÆITES, *shăf'ē-īts,* or Shafiites, *shăf'ĭ-īts:* one of the four principal sects of the Sunnites (q.v.), or 'orthodox' Muslims. Its name is received from its founder, Abu Abdallah Mohammed Ibn Idris, called Al-Shafei, from one of his ancestors, descendant of Mohammed's grandfather.

SHAFT, n. *shăft* [Dut. *schaft,* a stalk, a rod: Dan. *skaft,* a handle, haft: Icel. *skapt,* the shaft of a spear: AS. *sceaft,* a shaft]: something long and straight; a missile weapon, as an arrow; the handle of a weapon: the part of a column extending from the base to the capital (see below): pit or entrance to a mine when perpendicular or nearly so: one of the long poles between a pair of which a horse is harnessed to a carriage. Shaft'ed, a. having a handle or shaft.

SHAFT: body of a column, extending between the base and capital. In Gothic architecture, the term is applied to the small columns clustered round piers, or in the jambs of doors and windows. In the early styles, the shafts are frequently of finer material than the pier, such as Purbeck marble, and polished and banded. In later examples, the shaft is generally attached, and of the same piece as the pier. For illustration, see Column.

SHAFTESBURY, *shăfts'bėr-ĭ,* Anthony Ashley Cooper, first Earl of: English statesman and philanthropist: 1621, July 22—1683, Jan. 21; b. Wimborne St. Giles, Dorset; descended from a family intimately associated with the political history and literature of England. Sir John Cooper of Rockbourne, Hampshire, married Anne, daughter and sole heiress of Sir Anthony Ashley of Wimborne St. Giles, Dorsetshire, sec.-at-war in the reign of Queen Elizabeth. Their eldest son, Sir Anthony Ashley Cooper, was active in public affairs during the civil wars. He first espoused the cause of royalty; he then became one of the most eminent parliamentary leaders in the council, and not the least active in the field. When he saw that the restoration was inevitable, he took so prominent a part in bringing back Charles II. that he was raised to the peerage as Baron Ashley. He was a member of the justly infamous 'Cabal' ministry, and was afterward appointed lord chancellor, with the earldom of Shaftesbury. He was the 'Achitophel' of Dryden, by whom his character is drawn with truth and power. His life was crowded with political activity and management, until his 'fiery soul' wore out his small and fragile body. He will be honored for all time by men of English race and descent as the author of the Habeas Corpus Act. He also first introduced a bill rendering the judges independent of the crown.—He was grandfather of Anthony Ashley Cooper, third Earl of S. (q.v.), who obtained from Voltaire the questionable praise of being the boldest of English philosophers.

SHAFTES'BURY, Anthony Ashley Cooper, third Earl of: 1671, Feb. 26—1713, Feb. 4 (new style). John Locke superintended his education. At 11 years of age he could read Latin and Greek. After schooling at Winchester and an interval of travel, he was elected to parliament from Poole, and in a speech on trials for treason made the famous appeal from his own diffident hesitation, in favor of allowing counsel to the accused. He ignored party, to uphold individual liberty and rights of parliament. Succeeding to the earlship, about 1698, he was an active whig, and was offered the secretaryship of state, but, on the accession of Queen Anne, retired and lived the life of an invalid, dying in Italy. He was a pure, amiable, and benevolent man, and, contrary to prevalent impressions, a reverent attendant of the English Church. Dissenting from some doctrines, he treated them in what he esteemed a style of *bonhomie* raillery. His ethical system, characterized by the 'taste' or 'moral sense' phraseology, overlooked the intuitions and judgments of right, and exalted the emotional element; it was the ethics of an æsthetic gentleman. His natural theology was only optimism unqualified, and was versified in Pope's *Essay on Man.* S.'s well-meaning but superficial philosophies came to be a denounced heresy, chiefly because they were caught up and lauded by continental deists as 'the divine cultus of beauty,' the 'new-born Hellenism.' His various anonymous essays, on wit, humor, morals, etc., were by him collected in 3 vols. entitled *Characteristics of Men, Manners, Opinions, Times* (1711). He wrote also some essays on art. His *Letters to a Young Man in the University* were published 1716; others, with Letters of Locke and Sidney, 1830.

SHAFTES'BURY, Anthony Ashley Cooper, seventh Earl of: Christian philanthropist: 1801, Apr. 28—1885, Oct. 1; b. Grosvenor Square, London; son of Cropley, 6th earl, and of Anna, dau. of the 3d Duke of Marlborough. He was sent to Harrow, and thence to Christ-Church, Oxford, where he obtained a first-class degree in classics

1822. He represented the borough of Woodstock 1826–30; the county of Dorset (in which the family estates are situated) 1831-46; and the city of Bath 1847–51, when he succeeded to the earldom. During his long career in the lower house, he held one or two subordinate posts. He is renowned and honored for his attempts to improve the social condition of the laboring classes. As he belonged to the conservative party and represented an agricultural county, the manufacturers, and their organs in the press, received his allegations respecting the condition of their operatives in a hostile spirit, and retorted that the wages of families engaged in factories amounted to twice and three times the sum paid to the Dorsetshire laborers. Yet Lord Ashley returned again and again to the charge; and on the death of Mr. Sadler, M.P., took charge of the Ten Hours' Bill. The manufacturers declared with alarm that any reduction in the hours of labor would be fatal to British manufacturing supremacy. Successive governments naturally believed these prophecies, and almost all the leading statesmen of the day opposed the Ten Hours' Bill. But public opinion declared in favor of a limitation of the hours of labor. Lord Ashley carried his bill through parliament, and had the satisfaction of knowing that afterward the opponents of the measure admitted without exception that it was an act of wise and beneficent legislation, and that their alarms were groundless. When he visited the manufacturing districts, he was honored with an enthusiastic ovation. He refused to join Sir Robert Peel's administration 1841, because that statesman refused to countenance the Ten Hours' Bill. In 1846, he supported Sir Robert Peel in his proposal to repeal the Corn Laws, an act which cost him his seat for Dorsetshire. When he successfully contested Bath against Mr. Roebuck 1847, he appeared on the field of politics as a 'liberal conservative.' After his accession to the earldom S. became more prominent in connection with various religious, social, and philanthropic societies—so numerous that a list of the associations with which he was in some way officially concerned, would include almost every scheme having for its object the physical, moral, and spiritual improvement of society. He gave liberally not only of his money, but also of his time and thought, and of his earnest personal effort by day, and often by night in the worst parts of London, for encouragement of the abject, instruction of the ignorant, and reclamation of the vicious. He belonged to the Evangelical party in the Church of England, and was a prominent member of the chief church societies. He married a daughter of the fifth Earl Cowper, and was thus a connection by marriage of the late Viscount Palmerston, whose govt. he steadily supported, and many of whose ecclesiastical appointments and promotions of Evangelical clergymen were attributed to his influence. He followed up the Ten Hours' Bill by other measures regulating defective workshops and factories, night work, and treatment of children by their employers. He died at Folkestone.

SHAFTESBURY, *shăfts'bėr-ĭ*, commonly called Shaston: very ancient municipal borough in Dorsetshire, England, 27 m. n.n.e. of Dorchester. It stands on the narrow ridge of a chalk hill, and commands extensive and beautiful views of the counties of Dorset, Somerset, and Wilts. The date of its foundation is unknown, but it seems to have been a Roman station. In the reign of Athelstan (924–940) it contained two mints and an abbey of Benedictine nuns. Here Canute the Great died 1035. Pop. (1881) 2,312; (1891) 2,122.

SHAFTMENT, n. *shăft'mĕnt* [AS. *scæftmund—scæft*, a shaft; *mŭnd*, a hand]: measure of about 6 inches; a span.

SHAG, n. *shăg* [AS. *sceacga*, a bush of hair, what is rough and shaggy: Scot. *shag*, the refuse of barley: Icel. *skegg*, a beard—from *skaga*, to project, to jut out: Dan. *skjæg*, a beard, awn]· coarse hair or nap; a kind of cloth having a long, coarse, woolly nap; tobacco-leaves cut into shreds: Adj. in *OE.*, hairy; shaggy: V. in *OE.*, to make shaggy or rough; to deform. Shag'ging, imp. Shagged, pp. *shăgd.* Shag'gy, a. *-gĭ*, or Shag'ged, a. *-gĕd*, covered with long hair or wool; rough; rugged. Shag'giness, n. *-gĭ-nĕs*, or Shag'gedness, n. *-gĕd-nĕs*, the state of being shagged or shaggy.

SHAG: see Cormorant.

SHAGREEN, n. *shă-grēn'* [F. *chagrin;* It. *zigrino*, shagreen: Turk. *saghri*, the rump of a horse or an ass, the rough skin of certain fish]: generally, the rough prickly skins of sharks and dog-fish prepared as leather, used in covering cases, in polishing, etc. Shagreen', a., or Shagreened', a. *-grēnd*, made of or covered with shagreen: see Chagrin. Oriental S., formerly in great repute, consists of portions of the skins of horses, asses, camels, and oxen, the part used being strips taken from head to tail along the centre of the back. These stripes are prepared by soaking in water and currying; then laid on the ground, and the seeds of *Chenopodium album* are sprinkled over them; a board or piece of felt is then placed on the seeds, and by pressure the hard seeds are forced deeply into the skin, which, when dried and further prepared, presents granulations caused by the pressure of the seeds; and is finally dyed of various colors, most frequently green.

SHAH, n. *shâ* [Pers. *shah*, a king, a prince]: general title of the supreme ruler in Persia, also in Afghanistan, and some other countries of s. and central Asia. The sovereign, however, may, and frequently does, decline the title, assuming in its place that of *Khan* (q.v.), an inferior and more common appellation. The same title can be assumed by any of the shah's sons: and on all the princes of the blood the cognomen *Shah-zadeh* is bestowed.

SHAHI, n. *shâ'hĭ* [Pers.]: Persian copper coin of the value of 1¼ cents.

SHAH-JAHAN, *shâ-ja-hân'*, 'King of the World': title assumed on accession to the throne by Khorrum Shah, third son of Selim Jahan-Ghir, and fifth Mogul emperor of Delhi (reigned 1627–58); d. 1666, Dec. He was during his father's reign employed in military expeditions against the Rajputs, the independent Mohammedan states of the Deccan, and the Afghan tribes around Candahar, in which he distinguished himself by bravery and military skill; but on his return, he was forced into rebellion (1623) by the intrigues of his enemies at court, and was still unreconciled to his father at his father's death 1627, when he was at once saluted as emperor by the nobles. At his accession, the empire had reached the summit of its greatness, but the causes which led to its rapid decline at the same time unmistakably showed themselves: the territory was too extensive for the system of government which was generally pursued by the Moguls; the discordant parts were unconnected by any bond of union; the supreme ruler was regarded in many provinces as a mere tax-collector; and with the thus necessary absence of any spirit of loyalty, insurrections were frequent in all the provinces. The chief events of S.-J.'s reign were—the war against the Deccan sovereignties, resulting in the complete destruction of the kingdom of Ahmednuggur (1631), and the subjugation (1636) of those of Beejapur and Golconda; an indecisive contest against the Uzbeks of Balkh (1644–47); two unsuccessful attempts to recover Candahar from the Persians; and a second successful war, conducted by his third son, Aurungzebe, against the Deccan princes (1655). But in 1657 the emperor fell dangerously ill, and his four sons, ambitious of attaining supreme power, immediately began to dispute regarding the succession: see AURUNGZEBE. Ultimately, S.-J. was taken prisoner, and confined in the citadal of Agra till his death. S.-J. united the voluptuous profligacy so common in eastern monarchs with great sagacity, and the strict administration of justice to Moslem and Hindu alike. In his later years he became avaricious, increased the taxes, and confiscated the property of his wealthier subjects on the slightest pretexts. The magnificence of his court was unequalled; the splendid 'peacock throne' was constructed by his orders at a cost reported about $35,000,000, and many magnificent public buildings executed under his direction remain as monuments of his greatness. Chief of these are the city of Shahjahanabad (Delhi), and the mausoleum of Taj Mahal (see AGRA). Yet so strict was his financial management that he left a well-appointed army of 200,000, and a treasury containing $120,000,000 to his son Aurungzebe.

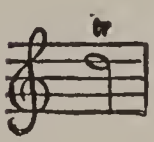
SHAHJAHANPORE, *shâ-ja-han-pōr'* or SHAHJAHANPUR, *shâ-ja-han-pōr':* town of Brit. India, principal place of the district of S., N. W. Provinces. It is on the Gurrah, a feeder of the Ramgunga, 94 m. n.w. from Lucknow. Pop. (1881) 74,830; (1890) 77,690; (1901) 76,458.

SHAH NAMAH, the title of a celebrated history of the ancient Persian kings in about 60,000 distichs, written by order of Sultan Mahmud of Ghizni, in the space of 30 years. Another S. N., in Turkish, comprises the history of all the ancient kings of the East, and was written by Firdusi Al-Thauil. Bajazet II., to whom the book was dedicated, ordered the author to reduce it from its original bulk of 300 vols. to 80. The mortified author preferred leaving the country, and emigrated to Khorassan, in Persia.

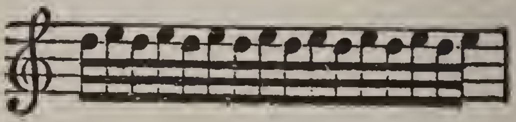
SHAIRP, *shärp,* JOHN CAMPBELL: 1819, July 30—1885, Sep. 18: b. Houstoun House, Linlithgowshire, Scotland. He was educated at Glasgow Univ. and Balliol Coll.; became asst. master at Rugby; prof. of humanity 1861, and principal 1868 in St. Andrew's Univ.; and prof. of poetry in Oxford 1877. Among his works are *Kilmahoe, with Other Poems* (1864); *Lectures on Culture and Religion* (1870); *The Poetic Interpretation of Nature* (1877); *Aspects of Poetry* (1881).

SHAKE, n. *shāk* [Icel. *skaka,* to shake, to jog: Dan. *skage,* to shift, veer]: rapid motion one way and another; a shock; concussion; agitation; a trembling or shivering, as from cold, fear, or sickness; motion of the hands when clasped in salutation; in *music,* the rapid up-and-down movement of the voice when dwelling on any particular note, but always within the compass of a tone (see below): fissure or rent in timber: V. to cause to move with short rapid vibrations; to give a wavering or trembling motion to; to throw or drive, followed by *down, from,* or *off;* to threaten to overthrow; to cause to waver or doubt; to lose firmness; to tremble; to totter; to shiver. SHA'KING, imp.: N. the act of shaking or agitating; a vibratory motion; a brandishing; concussion; the emaciation and weakness caused by disease or accident, said of a person recovering from illness. SHOOK, pt. *shûk,* did shake. SHAKEN, pp. *shā'kn.* SHA'KER, n. *-kėr,* one who shakes. SHA'KY, a. *-kĭ,* loosely put together; ready to come to pieces; not in good health; not well prepared to undergo any particular trial or strain. SHAKEDOWN, a temporary substitute for a bed, as on a sofa or the floor. SHA'KERISM, n. *-ĭzm,* principles of the Shakers (q.v.). TO SHAKE HANDS WITH, to express good-will at meeting or parting with a friend by shaking hands; to greet or bid farewell by the visible symbol of shaking hands; to become reconciled, as friends; to agree or contract with. NO GREAT SHAKES, *familiarly,* not worthy of attention; of no particular importance.—SYN. of 'shake, v.': to tremble; shudder; quiver; quake; agitate; toss; trill; shiver; vibrate; depress.

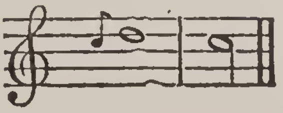
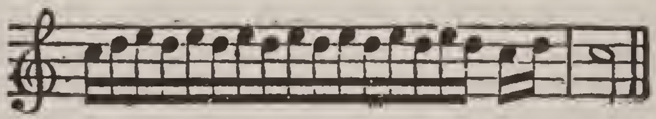
SHAKE, in Music: embellishment produced by the continued and rapid repetition of one note alternately with another either a whole tone or semitone above it. Its sign is *tr* (the first two letters of the Italian *trillo*), placed over or under the principal note. E.g.:



is played thus:



;

the exact number of repetitions being indefinite. A shake is often preceded by an Appogiatura (q.v.), and is generally finished with a turn, as, . played: . We may have shakes on two notes at once; and a series of shakes is called a chain of shakes.

SHAKERS, *shāk'ėrz:* name commonly given to a small religious sect found mostly in the United States. The proper or official description of this sect is the United Society of Believers in Christ's Second Appearing; but its members seem to have accepted the designation Shakers, though it was applied originally in ridicule on account of certain rhythmical movements of the hands and arms which form part of the ceremonial of their worship. Though the Shaker Societies are found only in the United States, their creed had an English origin. The founder of the sect, in whose person they believe that Christ has appeared a second time, was an English woman, Ann Lee (1736, Feb. 29—1784, Sep. 8.; b. Manchester, England; d. Watervliet, N. Y.), who emigrated to New York with a small band of disciples, arriving 1774, May.

Ann Lee was the daughter of a blacksmith in Toad Lane, Manchester; a very poor man, who gave her no education, and sent her while a mere child to work in a cotton-mill. She seems to have been a hysterical girl, naturally excitable and ambitious, and to have always possessed, in virtue of her strong will and vehement temper, much influence over the people around her. She married, while very young, a blacksmith named Stanley. She had four children, all of whom died in infancy—to this, perhaps, may be ascribed the preference of the celibate to the married life, which she ultimately raised into a part of her religious system. At the age of 22 she became one of the earliest believers in a prophetess, who had appeared in the town of Bolton-on-the-Moors, in Lancashire—a poor woman, Jane Wardlaw, wife of a tailor, who was a representative of the fanatical French Camisards (q.v.), some of whom had found refuge in England: this woman believed that she had 'received a call' to go forth and testify for the truth. The burden of Jane Wardlaw's message was, that the end of all things was at hand, that Christ was coming to reign upon the earth, and that his second appearance would be in the form of a woman, as prefigured in Psalm xlv. In subordination to this, she took up several of the tenets of the Society of Friends, to which she and her husband originally belonged; especially, she raised her voice against war and against all taking of oaths. Her followers believed that she was filled with the Holy Spirit;

they received her utterances as the voice of God; and she acted as if all the powers of earth and heaven had been given into her hands Ann Lee, on her conversion, began to preach the same message in Toad Lane and the adjacent streets of Manchester; but she soon went beyond her teacher, and gained the leadership of her co-believers for herself. It happened that she was brought before a magistrate, charged with an obstruction of the streets, caused by the crowd collected to hear her preach, and she was sent to the Old Bailey Prison in Manchester. When she came out of prison, she gave forth that one night a light had shown upon her in her cell; that the Lord Jesus stood before her; and that He became one with her in form and spirit. Her pretension was that Christ was come to reign in her person. It was favorably entertained by the followers of Jane Wardlaw; and they acknowledged her as their Head, or Mother, in place of Jane, whose pretensions had never risen to such a height. Ann found, however, that among her neighbors and fellow-workers, her claim to be the Bride of the Lamb, the Queen described by David in the Psalms, excited only ridicule; and she received a revelation that in America the foundations of Christ's kingdom were to be laid. So she went to New York, accompanied by seven disciples—five men and two women. Her husband also went with her; but he seems to have had no faith in her, and he left her soon after their arrival, in consequence of one of the features then introduced into her system. This was the practice of celibacy, which she had not previously enforced on her followers, though she had enjoined it as a duty. Her teaching was, that men called into grace must live as the angels do, among whom there is no marrying or giving in marriage; that no form of earthly love could be allowed in the Redeemer's kingdom. Finding a populous city unfavorable to her designs, she removed, with her followers, first to Albany, then far into the wilderness to Niskenna, and there founded the settlement which still exists, of Watervliet. It was in the spring of 1780—when she had been three years and a half at Niskenna, looking for new believers to come in, but making no attempt to win them—that the first American converts joined her Society. A religious revival at Albany had spread through the surrounding districts; and from Hancock and New Lebanon a deputation was sent to Niskenna, to see what light its inhabitants enjoyed as to the way of salvation. The deputation consisted of Joseph Meacham and Lucy Wright—subsequently the heads of the Shaker Society. These persons became believers in Ann Lee; through their agency, other converts were won, and a Shaker Society was established in the town of New Lebanon, which forms the post-village now known as Mt. Lebanon, in Columbia co. N. Y., on the border of Mass. Toward the close of 1780, the revolutionary war being in progress, notoriety was given to Ann Lee's pretensions, through an incident seemingly unfavorable. Owing to her British origin, her denunciations against war, and her refusal to take the colonial oaths, Ann was imprisoned at Poughkeepsie, on suspicion of being a British spy. Before she was let out of prison, 1780, Dec., all the colonies had heard of 'the female Christ.' In the following year, she started on a missionary tour through New England and adjacent colonies; she found the people everywhere curious to see her, and she made not a few converts. She did not return to Watervliet till 1783, Sep.; and about a year afterward she died. Her death was a surprise to many of her followers, who believed that she was to live among them for ever; but her successors—Joseph Meacham and Lucy Wright above mentioned—to whom, on her deathbed, she had made over the headship of the Society, were ready with a theory accounting for it: 'Mother Ann,' they said, could not die, and was not dead, and had not ceased to live among her people. She had only withdrawn from the common sight; she was still visible to eyes exalted by the gift of grace; she had cast the dress of flesh, and was now clothed with a glory which concealed her from the world. So it would be with every one of the saints in turn; but the spirits of those who 'passed out of sight' would remain near and be in union with the visible body of believers. This explanation was generally accepted, and this spiritist tenet has become a vital part of the Shaker creed.

By Joseph Meacham and Lucy Wright, the successors of 'Mother Ann,' the S. were gathered into settlements, ten in number; and a covenant was drawn up embracing the chief points of their creed, and of the social system since associated with it. Their head was, of course, 'Mother Ann'—that is, Christ—of whom Joseph and Lucy were temporarily the representatives; elders and deacons, male and female, were appointed; the institution of celibacy was confirmed; and a community of goods was introduced. On the death of Joseph Meacham 1796, 'Mother Lucy' became sole head of the Society, and she governed it with ample powers for 25 years. She named a female successor with the title Elderess; and the name of 'Mother' has not, since that time, been applied to the female head of the community. Eleven societies were formed 1787–92. Early in the 19th c. the S., taking advantage of a remarkable religious excitement in Ky., sent three representatives thither, and received sufficient additions to found five new societies. (See Nordhoff's *Communistic Societies of the United States*, 1875.) The S. were, at the census of 1870, about 2,500 in number, included in 18 societies; three in N. Y., four in Mass., two in N. H., two in Maine, one in Conn., four in O., and two in Ky. At the census of 1880, the Shakers reported 17 churches or communities, 2,400 members; (1890) 15 churches, 68 ministers, 2,400 members. They are a united and peaceful society.

Their doctrine has been to some extent developed as well as systematized since the death of 'Mother Ann.' They believe that the kingdom of heaven has come; that Christ has come upon earth a second time, in the form of 'Mother Ann,' and that the personal rule of God has been restored.

Then they hold that the old law has been abolished, and a new dispensation begun; that Adam's sin has been atoned; that man has been made free of all errors except his own; that the curse has been taken away from labor; that the earth and all that is on it will be redeemed. Believers, on going 'into union,' i.e., entering the society of S., die to the world, and enter on a new life—not a mere change of life but a new order of being. For them, there is neither death nor marriage; what seems death is only a change of form, a transfiguration which does not hide them from the purified eyes of the saints; and in 'union,' as in heaven, there is no marrying or giving in marriage—the believer owes love to all the saints, but his love must be celibate in spirit and in fact. The believer, living in union, *is* in heaven: the S. believe that the earth, now freed from the curse of Adam, is heaven; they look for no resurrection besides that involved in living with them in 'resurrection order.' The believer, entering into union, leaves behind all his earthly relationships and interests, just as if he had been severed from them by death. And since to be in union is heaven, the S. hold that no attempts should be made by them to draw men into union: God, they say, will draw to them at his own time those whom he has chosen. Those who have 'passed out of sight' are still in union; and the S. live in daily communion with the spirits of the departed believers. This belief in a communion with angels and spirits, is no mere theory; it has most important influence on their lives: they profess to be more familiar with the dead than with the living. As it is the work of the saints to redeem the earth from the effects of the curse, labor is a sacred and priestly function, especially when bestowed in making the earth yield her increase, and in developing her beauty. It should be done in a spirit of love; the earth, they say, yields most to those who love it; and love and labor will in time restore it to its primitive state. According to Hepworth Dixon, they bestow on their gardens and fields the affections which other men bestow on family or worldly goods. Their country they regard only as it is a part of the earth which they love, and as the favored land in which God's kingdom is first to be established. In its politics and its national fortunes, they take no interest; indeed, their whole system is a protest against the existing constitution of society, as well as against the ordinary lives of men. They look for a reconstruction of the whole social and governmental order; but this is to be reached only by the operation of moral principles: physical force they utterly abhor. Consistently with their belief in the second appearance of Christ in the form of a woman, the S. seem to believe that there is a female as well as a male essence in the Godhead—in the motherhood as well as the fatherhood of God.

A Shaker settlement is, for convenience, divided into families, consisting of the brothers and sisters, who live in the same houses, each governed by an elder and an elderess. There are two orders of members, Probationers and Covenanters—that is, novices and full members. It is on becoming a covenanter that the Shaker puts his property into the common stock. Entering on residence, he becomes subject to all the rules of the Society; but he is free—whether a covenanter or a probationer—to leave the body whenever he pleases. Both men and women wear a prescribed dress. The men wear a sort of Arab sack, with a linen collar and no tie; an under-vest buttoned to the throat, and falling below the thighs; loose trousers, rather short; and a broad-brimmed hat, usually straw. The women wear a small muslin cap, a white kerchief round the chest and shoulders, a skirt dropping in a straight line from the waist to the ankle, white socks, and shoes. Some latitude is allowed as to the materials of the dress. Men and women, according to Dixon's impression, have the look of persons 'at peace with earth and heaven.' 'Apart from a costume neither rich in color nor comely in make, the sisters have an air of sweetness and repose, which falls upon the spirit like music shaken out from our village bells.' [*New America*, by W. Hepworth Dixon (Lond. 1867), from which the materials of this sketch have largely been derived.] All labor with their hands, both men and women; but the women do only indoor work. Every man, whatever his rank in the church, follows some manual occupation, and most of them have more than one occupation. Working not for gain, but with loving care, and with the sense that they are exercising a priestly function, the S. are unrivalled among their neighbors in the arts to which they apply themselves, especially the culture of their land, and the production of fruits and flowers. Several important agricultural and mechanical inventions are due to them. They pay great attention to ventilation and to all sanitary conditions; they live almost entirely on the produce of the soil, and drink only water; they employ no doctors, and take no drugs, and are, nevertheless, among the most healthful of communities. Their Society is recruited mostly by young men and girls; but occasionally, married persons with their children come 'into union,' and make, it is said, 'very pretty Shakers.' Husbands and wives, when they have come 'into union,' become as brothers and sisters. The education of the children attached to the Society is the work of the sisters, and they do it exceedingly well. The brothers and sisters take their meals in a common room, eating at six in the morning, at noon, and at six in the afternoon. Their meals are taken in silence, any direction that has to be given being given by a gesture or in a whisper. In their church-service, music is prominent; the hymns and chants all being of Shaker origin, communicated to believers in dreams and reveries by the spirits with whom they have communion. A deputation of Shakers visited England 1871, and again 1877; and were welcomed with many attentions by the spiritists and the vegetarians, who entertained them at their homes and gathered large audiences to hear their earnest addresses; though not many converts seem to have been gained to Shakerism as a distinguishing tenet.

SHAKESPEARE, *shāk'spēr*, **William**: the chief literary glory of England: 1564, Apr —1616, Apr. 23; b. Stratford-on-Avon, in Warwickshire. The tradition is that his death was on the anniversary of his birth; and it is vouched by the parish register that his baptism was on Apr. 26. His father John S., seems to have belonged by birth to the class of yeomen. His mother, Mary Arden, was of more distinguished origin. She came of a good old Warwickshire family; and when married, she brought to her husband as dower a property called Asbies, 54 acres in extent, besides an interest in certain other lands at Wilmecote, and a small sum of money. In a contemporary document, John S. is described as a *glover;* and this trade, at that time more important than now, there is evidence to show that he conjoined with that of farmer and rearer of stock. His earlier career was one of steady prosperity, and the consideration to which he rose as a citizen is shown in his election 1569 as chief magistrate of Stratford. Of a family of four sons and four daughters born to him, William was the third child. There can be little doubt that young S. received his entire education at the free grammar school of Stratford. As to the precise character and amount of his education, there has been much controversial conjecture; some writers maintaining, on the internal evidence of his works, that he must have received a thorough classical training, while others represent him as probably destitute of any such youthful advantage. The celebrated 'And though thou hadst small Latin and less Greek' of his friend Ben Jonson, frequently quoted as certifying his ignorance, may tell rather the other way; for it assures us that, of both languages, he knew something; as to *how much* of either he may have known, it affords scarce a ray of light, inasmuch as we know nothing as to the amount of classical attainment sufficient, in the eyes of a scholar, and something of a pedant, like Jonson, to entitle a man to the praise of having *much* Latin and Greek. What Ben might contemptuously style 'small Latin' may have been what would seem to us a fair working allowance of it.

Meantime, misfortune had overtaken, and more and more come to press heavily on John S., who seems to have been an impulsive man, of some natural gifts, and with good intentions, but lacking in capacity to manage the large enterprises into which he was drawn. Consequently, William, now somewhat more than 14 years old, was withdrawn from school, and set to do something for his living. How he was employed from this time till his departure for London, it is impossible to make out with distinctness. One tradition—as likely to be true as not—informs us that, for a time, he served as apprentice to a butcher; and another story has it, that for some years he was a schoolmaster. The fact probably was that in those years young S. lived miscellaneously as he could. Out of the cloud of uncertainty which shrouds this period of his life, two facts, however, emerge as beyond question—his marriage, and the birth of his eldest born. As soon as may be after 1582, Nov. 28—on which day the license was

SHAKESPEARE.

A. D. 1564-1616.

procured at Worcester—Shakespeare, a lively lad of between 18 and 19 years, was married to Anne Hathaway of Shottery, a hamlet a mile or so out of Stratford, a damsel about eight years older than himself; and six months afterward a daughter was born to him, whose baptism bears record 1583, May 26. As to the early date of this birth, it is said, and we believe it is certain, that a mere betrothal before witnesses, to be followed within some reasonable undefined period by the religious ceremony, was then and there held to constitute a valid marriage; and this, it is conjectured, may in S.'s case have prefaced the more formal sanction. The only other children born of the marriage were twins, a boy and a girl, baptized 1585, Feb. 2. The boy (Hamnet) died in his 12th year.

As nearly as can be made out, about 1586, S., then aged 22, betook himself to London. A local tradition assigns as his reason for doing so a mishap which befel him, and a little imprudence consequent. The future poet, it is said, while out on a nocturnal poaching expedition in the deer-park which was considered to be under the charge of a neighboring magnate, Sir Thomas Lucy of Charlecote, was caught by the keepers, kept for the night a prisoner, and arraigned before Sir Thomas—a justice of peace—in the morning. What passed, is not recorded; but—as the old rumor goes—whatever it was, it excited the ire of S., who avenged himself, as a bard naturally might, by circulating 'a bitter ballad' in which the good knight was satirized. A further prosecution was for this irreverence directed against him, to escape which he is said to have fled to London. No anecdote concerning S. has been more widely accepted than this; and on the whole, it seems to deserve acceptance. An obvious allusion to the Lucies of Charlecote in the *Merry Wives of Windsor*, which identifies their coat of arms with that of Justice Shallow, is held to afford confirmation of it. Further, Oldys, an antiquary (died 1761) who busied himself much about materials for a life of S., certifies the story on something like fair evidence, and gives the first verse of the obnoxious pasquinade, as remembered in the district. It is more coarse and scurrilous than witty; but inasmuch as passages may be adduced from the admitted writings of S., in which the coarseness preponderates over the wit, this will scarcely of itself prove that he could not possibly have been its perpetrator. The indisposition which more lately has been shown to attach any credit to the tale, seems to rest on a disinclination to admit anything as possible in even the boyish conduct of the future poet which might seem to conflict with the reverence now universally accorded to his genius.

No certain details have come down to us as to S.'s earlier relations with the London theatre: indeed after an exhaustive research by scholars the years 1587–92 remain a biographical blank. According to one tradition, he was content at first to turn a penny by holding horses at the door. According to another—which seems in a natural sequence with the foregoing—we find him admitted inside on his promotion, though as yet only in the humble capacity of prompter's attendant. What is certain in the matter is, that if at any time he was thus meanly occupied, it could have been for only a brief period, as very speedily we have note of him as a man of some importance, at once dramatist, actor, and shareholder in the Blackfriars Theatre. Various considerations make exceedingly probable the conjecture that his leisure in his earlier years in London was given to a careful study of the Italian and French languages and literature. His works unquestionably show acquaintance with these languages, and especially with Italian writers: indeed the mold and atmosphere and coloring of many of his dramas are noticeably Italian. As an actor—though we find one contemporary allusion to him as 'excellent in the quality he professes'—he seems at no time to have shone especially, being rather respectable than eminent. As dramatist, his magnificent powers were at once recognized, and in no long time had won for him the very foremost rank among the writers for the stage of his time: within seven years he produced the poems *Venus and Adonis* and *Lucrece*, and at least 15 of his dramas. The extraordinary rapidity of his rise is shown in this indubitable reference to him in Spenser's *Tears of the Muses*, published so early as 1591, only about five years after S.'s arrival in London:

> And he, the man whom Nature's self had made
> To mock herself, and truth to imitate,
> With kindly counter under mimic shade,
> Our pleasant Willy, ah, is dead of late.

The reference here has indeed been surmised to point at Sir Philip Sidney, by Spenser elsewhere alluded to under the figure of Willy a shepherd; but the surmise is, on various grounds, inadmissible. The first two lines have the closest critical pertinence to the character of S.'s genius; as applied to that of Sidney, they are, by comparison, vague and unmeaning. Further, the 'mimic shade' in the third line, together with the whole context of the passage, makes it certain that a dramatic writer is alluded to; and this Sidney was not. Moreover, the stanza which follows, wherein of 'that same gentle spirit' it is said that he

> Doth rather choose to sit in idle cell,
> Than so himself to mockery to sell,

must needs be held to indicate a man at the time living; and Sidney had died 1586. The 'Ah, is dead of late!' which, literally taken, would suit Sidney, and not S., must, in the light of the succeeding couplet, be interpreted as referring to some temporary remission on the part of the latter of his wonted dramatic productiveness; and this, if not otherwise to be accounted for, we might explain by supposing him at this time engaged on his two elaborate poems, *Venus and Adonis* and *The Rape of Lucrece*, published not long afterward. The next year (1592) we find a contemporary and brother dramatist, Henry Chettle, making the *amende* to S. for an offense given, in terms most respectfully appreciatory of his excellences at once as man and as author; and 1598 Francis Meres, in his *Wit's Treasury*, writes of him as admittedly the 'most excellent among the English for both kinds of tragedy and comedy.' We have ample evidence besides of the unrivalled acceptance that his works obtained from all classes; not only were they in the wider sense popular, but they brought him special marks of favor and approval from Queen Elizabeth and her successor, James, who is said to have honored the poet with an 'amicable letter' from his own hand; and procured him the patronage and friendship of some of the most accomplished men of rank of the time, notably Henry Wriothesley, Earl of Southampton, to whom he dedicated his *Venus and Adonis* and *Rape of Lucrece;* and William Herbert, Earl of Pembroke, commonly held to be the 'Mr. W. H.' to whom, as their 'only begetter,' his *Sonnets* are addressed.

S. was plainly—as men of *consummate* genius often are—a man of shrewd, solid business ability; and throughout, his material prosperity kept pace with the growth of his poetical reputation. He became early, as we saw, a considerable shareholder in the Blackfriars Theatre. In the Globe, subsequently erected, he was also part-proprietor. To both he contributed dramas; and from his gains in the triple capacity of actor, author, and sharer of the general profits, he rapidly amassed a fortune. His local attachments were strong, and it seems to have become, as his wealth increased, one main object of his ambition to settle himself as a substantial country gentleman in his native district, to which annually he made a visit. We find him, with this view, from time to time making purchases there of house and landed property. By and by his visits to Stratford became more and more frequent; and it is certain that previous to 1613 he had ceased to reside in London, and finally established himself at Stratford. Of his last years there spent, further than that they lapsed peacefully in honor and the exercise of a liberal and kindly hospitality, nearly nothing is known. There is evidence of his having more or less occupied himself in agricultural pursuits, and good reason to believe that, though withdrawn from other active concernment with the stage, he still continued to write for it. His death was almost sudden. In the diary of Mr. Ward, vicar of Stratford, writing about 1660, is found the record that 'Shakespeare, Drayton, and Ben Jonson had a merry meeting.' A few days later, S. was attacked with the common scourge of English towns in those days—a fever, which ended his life in three days.

That S. erred at times like others, we know from the passionate confessions of his *Sonnets,* in considerable portions of which the self-reference is too plain to be denied; but that, whatever his occasional frailties, he was essentially a man of noble and estimable character, there is complete concurrence of testimony. He was obviously of most kindly and lovable dispositions; his 'pleasurable wit and good nature' made him delightful as a companion; and it was as 'gentle Will Shakespeare' that he was familiarly known to his contemporaries In particular with his associates and rivals in writing for the stage, his relations were cordial and even endearing. The gruff Ben Jonson writes of him after his death: 'He was honest (i.e., honorable), and of an open and free nature;' assures us that in 'his well turned and true-filed lines' we see but an authentic reflex of his beautiful 'mind and manners;' and avers that he 'honors his memory only on this side idolatry.' As a slight shadow on this pleasing picture, it has been shrewdly surmised that he was not very happy with his wife. Evidence of this has been sought in certain passages in his dramas; but obviously any inference from these is most precarious. The neglect of her in his will, except in one curt clause interlined, dismissing her with a legacy of his 'second-best bed,' seemed more decisive till Charles Knight greatly reduced its importance by showing that, the will apart, by the mere operation of the English law, the poet's widow was entitled to *dower*, and thus amply provided for. There is thus (though the query of why *second*-best, if a bed at all was to be left her, may perhaps have a certain pertinence) no basis of proof for the domestic unhappiness of Shakespeare. Still, it is certain that, spending great part of his time in London, the poet did not find it essential to his felicity there to have the society of his wife; as probably she, on the other hand, was content to abide in Stratford, since it seemed to him the desirable arrangement. It is fair, we think, to infer from this that the affection between the two was a little below enthusiasm.

To discourse here at this date of the genius of S. would be only to promulgate platitudes. The lofty eulogy of Dryden—'He was the man who, of all modern and perhaps ancient poets, had the largest and most comprehensive soul' has since been generally acquiesced in. As dramatist, he is admittedly in the world without a peer; as poet (abstracting the differential forms), there are but one or two names in literature to be even named beside his; and dismissing his claims in either kind, we have in his works such a treasury of gnomic wisdom on all matters of human concern as no other writer has ever bequeathed to the world. If we add that this greatest of writers is one of the most unequal—that his works contain more than might be wished of what, as the product of such a mind, we need not scruple to call rubbish—and that nearly every vice in writing might be illustrated from them almost at will, we say simply what is patent to every reader not blinded by the unreasoning idolatry which has sometimes displaced a rational admiration.

The only works of S. certainly published under his own hand were the two poems *Venus and Adonis* and *The Rape of Lucrece*, which appeared 1593 and 94 respectively. As was naturally to be expected in the case of pieces on the stage so popular, certain of his dramas found their way from time to time into print, but no authoritative edition of any of them was issued during his lifetime. The first collected edition of his dramas was issued 1623, by Heminge and Condell, his friends and co-proprietors in the Blackfriars and Globe theatres. A second edition followed 1632; a third 1664; a fourth 1685. In 1709 appeared the edition of Rowe, with a prefatory sketch of the poet's life. Of the 'Shakespearean literature' which followed, and the various re-issues of the dramas, with such masses of critical commentary and emendation as probably no other writer has ever been made the subject of, it would be hopeless to attempt an account. It must suffice to mention as successive editors Pope, Theobald, Sir Thomas Hanmer, Warburton, Capell, Stevens, Malone; and Dr. Johnson, whose elaborate introductory essay—whatever may be thought of the insolence of much of his criticism of the plays in detail—is perhaps on the whole, as an estimate of the genius of the poet, as satisfactory as any that has since been written. Till the present time, there has been no remission of activity in this field of literary labor. The intelligent industry of Charles Knight specially deserves mention; and Dyce, John Payne Collier, and Singer have put forth elaborate and valuable editions of the dramas. An important edition was issued from Cambridge, England, 1863-66, under the superintendence of two gentlemen of unquestioned scholarly competence, W. G. Clark and W. Aldis Wright. Among recent English Shakespearean writers and editors are Dowden, Furnivall, Halliwell-Phillipps, and Swinburne: the edition by G. Steevens is notable. American scholars in this field have done honorable work—Henry Giles, R. G. White, H. N. Hudson, H. H. Furness, and others.—The theory, voluminously argued by a few writers, which traces the authorship of S.'s plays to Lord Bacon, is regarded by the generality of scholars as merely an amusing specimen of wild assumption elaborately systematized.

In Germany, S. has long been thoroughly naturalized; and the German enthusiasm in regard to him is, if possible, even greater than the English. It was the celebrated Lessing who first decisively introduced him to notice in a series of essays, exhibiting the immeasurable superiority of his art to that of the pseudo-classical models of the French stage. Since Lessing, many of the most gifted Germans have engaged in the work of Shakespearean criticism and elucidation. From Goethe we have some exquisite fragments, most notably the criticism of *Hamlet* in his *Wilhelm Meister;* and after his, the names of Tieck, A. W. Schlegel (whose *Lectures*, 1809–11, almost constitute an era in this special department of literature), Franz Horn, and Gervinus (an Eng. translation of whose elaborate Commentaries has been published), occur as the most illustrious in connection with the present topic. By Tieck and Schlegel together the work of translation was undertaken; and the result of their joint labors, which takes rank as the standard German S., ranks also, in the opinion of competent judges, as a consummate and almost *unique* specimen of excellence in the translator's art. It has frequently been alleged that, till the Germans made the discovery for them, the English people knew nothing of the greatness of Shakespeare. This is on the face of it ridiculous. The single sentence above cited from Dryden, and the practical acceptance of it implied in the unexampled attention and industry which never ceased to be directed to the subject by English scholars, sufficiently confute so idle a notion. What the Germans really did (and with their services in the matter must be included those of Coleridge, whose impulse and point of view, at least, if not something considerably more, were derived from German sources) was somewhat to methodize and illumine for the English mind an admiration never deficient, but always, like Jonson's regard for the memory of his friend, 'only on this side idolatry.' The old notion of S. was that of a genius in power and plenitude unrivalled, but lawless in its modes of operation, and more or less chaotic in its results; 'wild above rule or *art*, enormous bliss.' The new German criticism traced and revealed in the seeming chaos the orderly outlines of a world; co-ordinated the confusion under rules till then unsuspected; and showed, in what before had seemed irregular exercise of power admitted to be magnificent, obedience not less magnificent to a law of artistic evolution. It made calculable, in a word, the orbit of a luminary which had somewhat uncomfortably seemed to have swept at random through space. But the English people did not need it to *reveal* the luminary to them; throughout and from the first, they had recognized it with a wondering delight. Also, to a great extent, it is due to the German enthusiasm of exposition that over the whole continent, and wherever on other continents literature is intelligently studied—except for some little lingering, dying remnant of French prejudice—the poet *par excellence* of England is now finally enthroned as the poet also *par excellence* of the whole modern world. The expositors and critics of S. in various lands and languages are innumerable.

SHAKESPEAREAN, a. *shāks-pē'rĭ-ăn:* of or pertaining to Shakespeare or his works, or in his style.

SHAKO, n. *shăk'ō,* SHAK'OES, n. plu. *-ōz:* see CHACO.

SHALE, n. *shāl* [Ger. *schale,* a shell; *schälen,* to peel or shell off]: a shell or husk. In *geology,* shale or slate-clay is an indurated clay, which often forms beds in the geological series. It is composed chiefly of silica and alumina in variable proportions, but also frequently contains considerable carbonate of lime and oxide of iron. It is of gray or grayish-black color, or brownish when containing much iron. as hydrated peroxide, and red when the peroxide is anhydrous; sometimes the color is olive. Its structure is more or less slaty. It is soft, and easily reduced to powder. When free from lime and iron, it is reduced to powder, and used for making fire-bricks, for which it affords excellent material. S. very often contains a notable quantity of bitumen, and when this is so much the case that the mineral crackles and blazes in the fire, emitting a black smoke and a bituminous odor, it is known as *Bituminous Shale.* This variety sometimes passes on the one hand into common S., and on the other into coal. Impressions of ferns and other plants are very frequently found in shale of the coal period.

Slate, Schist, and Shale are names employed to denote those kinds of rock which are laminated or fissile—that is, which possess a structure readily splitting into thin layers. *Schist* is a term properly applied only to crystalline rocks—namely, such as have an imperfect fissile character, such as hornblende and other schistose rocks. *Slate* is a name applied to those that are readily and evenly separable into thin layers. True slate differs from schist and shale in not having its lamination produced by bedding: see SLATE.

S. varies much in composition. Clay, sand, lime, bitumen, and other bodies, either singly or any mixture of them, are included under the name if they form rocks which split into layers in the direction of their bedding; clay, however, being an ingredient in most shales. Strange as it may seem, the line between even coal and some kinds of S. is not well defined; and in the case of the Torbanehill mineral, found near Bathgate, England, the question by which of the two names it should be called led to a lengthened and costly litigation.

The importance of certain decomposing shales through which sulphuret of iron is dispersed, for the manufacture of alum, has been long known, and a large quantity is raised for that purpose from the carboniferous beds of England, France, Germany, and N. America. The unconsolidated Tertiary clay of Gayhead, Martha's Vineyard, is much used for the alum industry.

Bituminous shales—that is, shales more or less rich in carbon and hydrogen—form a class of these bodies which have, in recent years, attracted much notice as sources of oil for illuminating purposes. But neither in France nor in England did the first attempts at profitable manufacture succeed. On account of these failures, the process fell into abeyance, until it was revived by the success of the well-known patent of James Young (see PARAFFIN OIL), 1850, for production of paraffin and paraffin-oil from coal. Except for the solid paraffin, which Young was the first to obtain on the large scale, and the employment of coal instead of shale, the processes of Du Buisson and Young are essentially the same. This process has created an important branch of industry, paraffin-oil and paraffin being economically obtained by it from either coal or shale of certain kinds. Many of the shales were found on trial to yield 30 to 50 gallons of crude oil per ton; and works—several of great size—were accordingly started in many places over the entire area of the coal formation in Scotland, also at various localities in England, for manufacture of mineral-oil, paraffin, etc., from this material. The enormous development of the mineral-oil industry in the United States, and to a considerable extent elsewhere, has not destroyed the British manufacture from shales; it has only led to ingenious devices for extracting every element of value and using all combustible waste for fuel. In Scotland, 1884, $10,000,000 were invested in the works, which distilled 4,170 tons of shale per day.

Owing partly to the comparative cheapness of S., partly also to the fact that these products are obtained from it in a state more easily purified than when they are got from coal, the use of coal as a source of them is now almost given up. In Scotland, where chiefly the manufacture of paraffin-oil is carried on, the shales used are called 'oil shales,' and it is estimated that 1,300,000 tons of this material yield the following products:

Crude oil	32,000,000 gallons.
Paraffin	400,000 "
Lubricating oil	25,000 tons.
Paraffin scale	15,300 "
Sulphate of ammonia	10,500 "

In addition to these are illuminating gas, gasoline, naphtha, etc.

SHALER, *shā'lėr*, ALEXANDER: soldier: b. Haddam, Conn., 1827, Mar. He entered the army 1845, and held the rank of maj. at breaking out of the civil war; became lieut.col. U. S. chasseurs 1861; promoted col. 1862; brig.-gen. U. S. vols. 1863. He took part in the battles of Fair Oaks, Malvern Hill, Fredericksburg, Marye's Heights, and Gettysburg; was taken prisoner in the battle of the Wilderness, and after exchange served in the southwest. He was brevetted maj.gen. 1865; was maj.gen. of the 1st division of the national guard 1867–86; reorganized the Chicago fire dept. after the great fire; was commissioner of the fire dept. of New York 1870–73; and pres. of the New York board of health 1883–87.

SHA'LER, NATHANIEL SOUTHGATE: geologist: b. Newport, Ky., 1841, Feb. 22. He graduated from Lawrence Scientific School, Cambridge, 1862; became asst. in the Harvard Museum of Comparative Zoology 1864; was prof. of paleontology in Harvard College 1868–87, when he became prof. of geology. He was director of the Ky. geol. survey 1873–80; and 1884 was appointed geologist to the Atlantic division of the U. S. geological survey. He has contributed important articles to periodicals, and published reports of the Ky. survey, *Aspects of the Earth* (1890), and several scientific works.

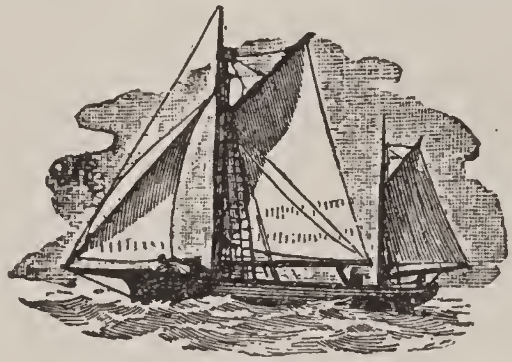
SHALL, v. *shăl* [the true origin seems to be Norw. *skil*, separation, difference: Icel. *skil;* Norw. *skiel*, right: Sw. *skal*, reason, ground, motive: Icel. *skal;* AS. *sceal*, I shall—fundamentally signifying, I have ground for, I have reason]: an auxiliary and defective verb; one of the two signs employed to express futurity, *will* being the other; in the first person *shall* simply foretells or declares; in the second person (shalt) and third person (shall) it promises or expresses determination; interrogatively, *shall* either asks for permission or for direction; *shall* like *will*, apart from its other senses, uniformly denotes futurity. SHOULD, pt. *shûd*, as an auxiliary, expresses a conditional present, a contingent future, an obligation or duty.

SHALLI, n. *shăl'lĭ:* a twilled cloth made from hair of the Angora goat; name now applied to a fabric resembling muslin-de-laine, without twill.

SHALLON, n. *shăl'on*, or SALAL, n. *săl'al* [etym. doubtful]: *Gaultheria Shallon*, small, shrubby, evergreen heathwort, with white flowers, growing in pine forests in N. America. The berries are used for tarts, and the Indians make them into bread.

SHALLOON, n. *shăl-lôn'* [from *Chalons* or *Chalons-sur-Marne*, in France]: light worsted cloth, said to have been made first at Chalons, in France.

SHALLOP, n. *shăl'lŏp* [F. *chaloupe;* It. *scialuppa;* Sp. and Port. *chalupa;* Dut. *sloep*, a sloop]: small light boat.



Shallop.

Also, a large, open, old-fashioned boat, carrying two masts, rigged as in a schooner. Its principal use was in the fisheries.

SHALLOT, n. *shăl-lŏt'* [F. *échalote;* OF. *eschalote*, *escalogne*—from L. *ascalōnĭă*, a shallot—so called from *Ascalon*, a city of Palestine: It. *scalogno*], (*Allium Ascalonicum*): plant, native of Palestine, whence it was brought to Europe by the Crusaders. It is grown for its bulbs, which somewhat resemble those of the onion. Its leaves also are used to some extent. It is hardy and can be brought to market several weeks earlier than the onion. It is grown from the bulbs, which are divided, and, in the latitude of New York, planted in Sep. or Oct. in rows 12 in. apart, and 6 in. apart in the row. The main difference in the so called varieties is the size which they attain. This is determined mainly by the character of the soil and the care in cultivation.

SHALLOW, a. *shăl'lō* [Swiss, *schalb*, slanting: Icel. *skiálgr*, oblique: Scot. *schald*, shallow]: having little depth; not far to the bottom; superficial; trifling; empty; silly: N. any place where the water has but little depth; a flat; a shoal: V. to make shallow. SHAL'LOWING, imp. SHAL'LOWED, pp. *-lōd.* SHAL'LOWLY, ad. *-lĭ*, with no great depth; simply; foolishly. SHAL'LOWNESS, n. *-nĕs*, the state of being shallow; want of depth; want of understanding; emptiness; silliness. SHALLOW-BRAINED, a. silly; empty-headed.

SHALM: see SHAWM.

SHALT, *shălt:* second pers. sing. of SHALL, which see.

SHAM, n. *shăm* [probably the same word as SHAME, which see: comp. Ger. *schemen*, a shadow, phantom: Gael. *seamasan*, an evasion, a sham]: something that deceives expectation; a pretense; an imposture: ADJ. false; pretended: V. to pretend in order to deceive; to counterfeit; to make false pretenses. SHAM'MING, imp. SHAMMED, pp. *shămd.* SHAM'MER, n. *-mėr*, one who shams. To SHAM ABRAHAM, in *slang*, to pretend to be ill.

SHAMAN, n. *shăm'ăn* [Pers. *shaman*, an idolater]: priest or conjurer among the Ostiaks and some other tribes in Asiatic Russia, who believe in the existence of a Supreme Being, but assign the immediate government of the world to secondary gods, some of whom are benevolent and others malevolent, and by whose aid the *Shamans* pretend to cure diseases, foretell events, etc. SHAM'ANISM, n. *-ĭzm*, the idolatrous worship and practices of the Ostiaks and other inhabitants of Siberia; the ancient religion of the Tartar and some other Asiatic tribes. It is a belief in sorcery, and a propitiation of evil demons by sacrifices and frantic gestures. The following account of it is from the *Asiatic Journal.* The priests are men or women, married or single. The character is acquired by pretending that the soul of a deceased priest has appeared to the individual in a dream, appointing him or her his successor. If the priests are in function, they wear a long robe of elk-skin, hung with small and large brass and iron bells; moreover, they carry staves carved at the top into the shape of horses' heads, also hung with bells; and with the assistance of these staves, they leap to an extraordinary height. The followers of the Shaman religion have neither altars nor idols, but perform their sacrifices in a hut raised on an open space in a forest or on a hill. Nor are there fixed periods for the performance of their ceremonies; births, marriages, and sickness, uncommon appearances in the atmosphere, or public calamities, are generally the occasions which call for them. The animal to be sacrificed is usually fixed upon by the Shaman or the donor; and after the persons uniting in the ceremony have assembled, the Shaman enters the hut, chanting certain words, sprinkles on all the sides of the hut, and over the fire, spirits and milk, and then orders the animal to be killed, which is done by its heart being torn out. The skin of the victim is then stripped off, and its flesh, except a few pieces thrown into the fire, is consumed by the persons assembled. See also LAMA. SHAM'ANIST, n. *-ĭst*, believer in Shamanism.

SHAMBLE, v. *shăm'bl* [O Dut. *schampelen*, to shamble: Swiss. *tschümpelen*, to go about in a slack and trailing manner: a form of *scamble*, to scramble]: to walk awkwardly and unsteadily, as if the knees were weak SHAM'BLING, imp *-blĭng:* ADJ. moving awkwardly and irregularly: N. an awkward, clumsy, irregular gait. SHAM'BLED, pp. *-bld.*

SHAMBLES, n. plu. *shăm'blz* [L. *scamil'lus, scamellum*, dim. of *scamnum*, a bench or stool: OF. *eschamel*, a stool: AS. *scamel*, a stool —*lit.*, the benches on which meat is exposed for sale]: a slaughter-house; a flesh-market; in *mining*, niches or shelves placed at suitable distances, so that the ore, being thrown from one to another, is thus gradually raised to the top of the mine.

SHAME, n. *shām* [Icel. *skömm*, shame, dishonor; *skamma*, to dishonor: Dan. *skam;* AS. *sceamu*, shame, disgrace]: the uneasy sensation of mind produced by a consciousness of guilt or loss of reputation, or from the exposure of that which modesty prompts us to conceal; the pain or emotion arising from the thought of another person beholding us, or something connected with us, with contempt, indignation, or disgust; that which brings reproach, and degrades in the estimation of others; reproach; dishonor; disgrace; ignominy: V. to fill with shame; to cause to blush. SHA'MING, imp. SHAMED, pp. *shāmd.* SHA'MER, n. *-mėr*, one who makes ashamed. SHAME'FACED, a. *-fāst* [a corruption of AS. *scamfæst;* OE. *shamefast*, that is, quick or *fast* in feeling shame]: easily confused; bashful. SHAMEFACED'LY, ad. *-fāst lĭ.* SHAMEFACED'NESS, n. *-nĕs*, excess of modesty; bashfulness. SHAME'FUL, a. *-fûl*, that brings shame; raising shame in others; disgraceful; unbecoming. SHAME'FULLY, ad. *-lĭ*, in a manner to cause shame; disgracefully; with indecency. SHAME'FULNESS, n. *-nĕs*, the state or quality of being shameful. SHAME'LESS, a. *-lĕs*, insensible to shame; done without shame; impudent; immodest. SHAME'LESSLY, ad. *-lĭ.* SHAME'LESSNESS, n. *-nĕs*, want of sensibility to disgrace or dishonor; immodesty. FOR SHAME! shame on you! you should be ashamed. TO PUT TO SHAME, to cause to feel shame; to inflict shame on.—SYN. of 'shameful': disgraceful; unbecoming; degrading; ignominious; infamous; vile; scandalous; reproachful; indecent;—of 'shameless': bold; audacious; impudent; unblushing; brazen-faced; indelicate; immodest; indecent.

SHAMMAI, *shăm-mī'* or *shăm'ma-ī* (not to be confounded with Sammeas): eminent doctor of the Jewish law at the time of Herod; head of a most important school, and supreme judge of the Sanhedrim (Ab-Beth-Din) during the presidency of Hillel (q.v.), with whom he is, indeed, generally mentioned, and of whom he was, as it were, the counterpart. Very little is known of his life. He was born probably in Palestine, and most energetically participated in all the political and religious complications of the country. There was a harshness and rigidity in his character which contrasts strikingly with Hillel's proverbial patience. His religious views were painfully strict, and he even tried to extend the rigor which he imposed on himself to the youngest children; but the zealotism with which later times have charged him is not his, but his school's, 'the House of Shammai,' as it was called. This seems, under the adverse circumstances of the commonwealth—sedition within, and the approaching enemy without—to have developed a fanatical zeal that at times surpassed all bounds, and tended to foster that exceptional exclusiveness which proved both the bane and the saving of Judaism. The discussions of the two rival schools, of which that of S. preponderated long after the master's death, turned exclusively on points of positive law. There is only one curious metaphysical debate recorded—viz., whether, as one school held, 'it was better for man to have been created or not;' or, as the other asserted, 'it would have been better if he never had been created.' Finally, they both agreed in the latter axiom, but with the addition—'but since he is now in this world, let him be careful in his actions.' This discussion and final decision throw a strange light on the times of unequalled national misery that begot them.

SHAMMY, n. *shăm'mĭ*, or SHAMMOY, or SHAMOY, n. *shăm'oy*, and SHAMOIS, n. *shăm'oys* [F. *chamois*, a wild goat, the skin of it dressed: It. *camoscio*, the chamois]: kind of leather, esteemed for its softness, pliancy, and quality of bearing soap without damage—originally made from the skin of a species of antelope, now also from other skins: see CHAMOIS: also LEATHER.

SHA'MO: see GOBI.

SHAMOKIN, *sha-mō'kin:* postborough in Northumberland co., Penn.; on the Lehigh Valley, the Northern Central, and the Philadelphia and Reading railroads; 18 m. s.e. of Sunbury, the co. seat. It is in a valuable anthracite coal region, and its chief industry is mining and shipping coal. It contains iron foundries and machine shops, waterworks supplied from Shamokin creek, 10 churches, public high and grammar schools, public library, 2 nat. banks (cap. $200,000), 1 sav. bank (cap. $50,000), 2 daily and 2 wkly. newspapers. Pop. (1890) 14,403; (1900) 18,202.

SHAMPOO, v. *shăm-pô'* [Hind. *tshampna*, to squeeze]: to rub and press the limbs and joints in connection with the hot or Turkish bath, after the eastern manner; to wash and rub the head, as in hair-dressing: N. the act or operation of shampooing. SHAMPOO'ING, imp.: N. the act or operation of rubbing and pressing the joints and limbs in connection with the hot or Turkish bath; also, the act of washing and rubbing the head. SHAMPOOED', pp. *-pôd'*. SHAMPOO'ER, n. *-ėr*, one who shampoos.

SHAMROCK, n. *shăm'rŏk* [Ir. *seamrog*, trefoil]: the three-leaved white clover, or wild trefoil—national emblem of Ireland; the *Trifolium rĕpens*, ord. *Leguminōsæ*, or some plant of the nearly allied genera; others think it the Wood-sorrel, *Oxălis acetosel'lă*, ord. *Oxalĭdācĕæ*, as it comes into flower about St. Patrick's Day; said to have been the sacred symbol of the anc. Persians. It is probable that the name has general reference to plants with trifoliolate leaves, and that a more exact determination of the species may be

The Shamrock.

as difficult as in regard to the emblematic thistle of Scotland.

The small-leaved clover (*Trifolium repens*) has had superstitious respect from early times. According to the elder Pliny, no serpent will touch it. It is said to have been assumed as the badge of Ireland, from St. Patrick's use of it to illustrate the doctrine of the Trinity. See TREFOIL.

SHAMYL, or SCHAMYL, *shăm'ĭl* (Eng. 'Samuel'): celebrated leader of the independent tribes in the Caucasus; about 1798–1871, Mar.; b. at Aul-Himry, n. Daghestan; of a wealthy Lesghian family of rank. He was one of the zealous disciples of Kasi-Mollah, the great apostle of Muridism, and ably seconded his endeavors to compose the numerous feuds of the various Caucasian tribes, and unite them in a bond of antagonism to their common enemy, the heretical Russians. He was one of the foremost in the defense of Himry against the Russians, 1832, and after the fall of his chief, Kasi-Mollah, and most of his adherents, fought his way alone and severely wounded through the besiegers' ranks. After the assassination of Hamzad-Bey, successor of Kasi-Mollah, in the end of 1834, S. was unanimously elected 'imaum,' and being absolute temporal and spiritual chief of the tribes who acknowledged his authority, he made numerous changes in the religious creed and political administration, more fully concentrating in himself the whole power. These changes were certainly the chief cause of the great successes which subsequently attended the mountaineers, but they produced that sudden collapse of the spirit of independence which ensued when the great leader was removed. S.'s change of military tactics, from open warfare to surprises, ambuscades, etc., brought numerous, and sometimes great successes to the arms of the mountaineers. General Ivelitch was severely defeated 1837, the worst reverse that the Russians had yet sustained, and his coadjutor Hafi was forced to disastrous retreat. They succeeded, however (1839), in hemming S. into Akulgo, in Daghestan, took the fortress by storm, and put every one of the defenders to the sword, in order to be certain that S. should not escape. How he did so is not known; his own followers and the Russians believed him to be dead, when he suddenly appeared, preaching with more vigor than ever the 'holy war against the heretics.' In 1843, he conquered all Avares, besieged Mozdok, foiled the Russians in their subsequent campaign, and gained to his side the Caucasian tribes which had hitherto favored Russia. This accession of power rendered necessary some change in the government, a civil and a criminal code were promulgated, a regular system of taxation established, and Dargo was made the capital of this Caucasian monarchy, whose pop. (1844) exceeded 1,000,000. But the Russians, under Prince Woronzoff, having changed their tactics, assailed the country on various points at the same time, and the advance gained was secured by chains of forts. The fortune of war, however, steadily alternated till 1852, when Bariatinsky compelled S. to confine himself to the defensive, and deprived him of his victorious prestige. Some of the tribes now returned under Russian authority, and S. (probably owing to his diminished power and resources) was unable to take advantage of the diversion in his favor afforded by the Crimean war; after which the Russians resumed their attacks with more energy, opened a road over the mountains, thus cutting off one portion of the patriots, and compelling their submission. The following year was still more disastrous; 100 villages were destroyed, the inhabitants transplanted to Russian districts, and S. himself defeated Aug. 11. 1859, Apr. 12, his chief stronghold Weden was taken after seven weeks' siege, and his authority, except over the small band of followers who still devotedly adhered to him, was destroyed. For several months he was a mere guerilla chief, hunted from fastness to fastness, till at last (1859, Sep. 6) he was surprised on the plateau of Gounib, and after a desperate resistance, in which his 400 followers were reduced to 47, he was captured. His wives and treasure were spared to him, and he was sent to St. Petersburg, where he met a generous reception from the czar. A few days afterward, he was assigned a residence at Kaluga, with a pension of 10,000 roubles. Thence he went 1870 to Mecca, remaining a paroled prisoner of the Russian government; and died at Medina.

SHANDYGAFF, n. *shăn'dĭ-găf* [etym. doubtful]: mixture of beer and ginger-beer.

SHANGHAI, *shăng-hī':* most important maritime city of China, on the left bank of the Hwang-poo or Woo-Sung river, 12 m. from where it debouches into the s. portion of the mouth of the Yangtse-kiang, lat. 31° 14′ n., long. 121° 30′ e. Though it is now one of the first emporiums of commerce in the East, only a quarter of a century ago it was but a third-rate Chinese town. It is a *heen* or *district* city, having a wall 3 m. in circuit, though which 6 gates open into extensive suburbs. The low alluvial plain on which it is situated is of great extent, and intersected by innumerable creeks, which environ the walls, and permeate the city in various directions. It is a dirty, poorly-built town; the houses are of brick, the streets very narrow and constantly crowded with people. Few buildings rise above the low walls of the city; the only conspicuous objects are the Rom. Cath. cathedral, a massive edifice, and the lofty spire of the Bapt. chapel. The temples present the same general appearance as in all Chinese cities. Every city has its Ching-hwang, or temple of the tutelary gods; that of S. is in a picturesque position on a rocky islet, surrounded by a serpentine sheet of water crossed by zigzag bridges. A little further down the river are the foreign settlements, English, French, and American. All the mercantile *hongs* are built on the English concession; while the French concession is mainly occupied by *go-downs*, wharves, and Chinese houses. There are no French merchants in Shanghai. The river in front of the Chinese town is thronged with junks, lashed side by side for two miles. The reach in front of the foreign settlement was formerly crowded with sailing-vessels;

but since the opening of the Suez canal, steamers of the Peninsular and Oriental Steam Navigation Co. and of private companies have largely taken their place. Lower down are the ship-yards, machine-shops, and dry-docks, which foreign commerce has called into existence; and here the Chinese govt. has an arsenal where war-vessels of the largest tonnage are built and equipped. Under the arrangement by which the foreign custom-house dues are collected by foreigners, facilities have been created to navigation of the Yangtse by stationing a light ship, buoys, and signals, rendering safer the approach to this important mart. One or two light-houses also have been erected. There are a chamber of commerce, reading-room, library, and literary institution—nothing being lacking to render the port of S. the metropolis of eastern commerce. The muncipal govt. of the foreign settlement is highly creditable to the mercantile traders. Several gentlemen are elected annually by the land-holders, for the purposes of local government—police, public improvements, and repairs requiring much management, and entailing much expense, the funds for which are obtained by taxation. S. is the seat of various Christian missions—whose schools, dispensaries, and other benevolent objects have generous support from foreign merchants. The products of S. itself are not of much value; but the city is a most important entrepot for goods passing between the n. and s. provinces of China, as well as for imports and exports from and to foreign countries. It was in the possession of the Tae-ping rebels 1853–55, and the prosperity of the native town and the foreign settlements was in peril for a time; but it enormously advanced after their expulsion—the English quarter in particular becoming a refuge for the Chinese from all parts of the province of Kiang-su, which the Tae-pings continued to desolate till 1862. The trade of the port increased threefold 1860–63, owing to the large and increasing trade of the ports opened on the Yangtse. S. was connected with Tien-tsin by telegraph 1881. Imports of foreign produce 1870–80 had a value of $60,000,000 to $70,000,000 (about half from Britain), and of native produce more than $50,000,000; exports of native produce, about $40,000,000. In 1891 imports of merchandise at S. were $120,000,000; exports $56,000,000. The aritcles of import and export are most miscellaneous; chief imports being opium, English cotton and woolen goods, and metals; and chief exports, tea and silk. Great quantities of the opium imported into S. are re-exported to other parts of China. The mercantile importance of S. has increased greatly through the opening of the Yangtse river to commerce. In 1876, the first railway in China was opened from S. to Kangwang, but it has since been bought up by govt. and closed. Pop. (1890) 380,000; (1910) 620,000.

SHANK, n. *shăngk* [AS. *scanca*, the hollow bone of the leg, the shank: Dan. *skank;* Ger. *schenkel*, the shank: It. *zanca*, a leg]: the leg from the knee to the ankle, or the large bone of that part; the handle or long part of any instrument; in *arch.*, the plain space between the two channels of the Doric triglyph; also, the shaft of a column: V. to sink or excavate a pit or shaft, as being the shank to the mine. SHANK'ING, imp. SHANKED, pp. *shăngkt:* ADJ having a shank. TO SHANK OFF, to fall off, as flowers, through decay of the footstalk.

SHANNON, *shăn'on:* largest river of Ireland, rising in the Cuilcagh Mountains, county of Cavan, and after a course of 230 m. entering the Atlantic Ocean between the headlands of Loop and Kerry Head. It is commonly divided into two portions, the Upper S. from its source to Limerick; and the Lower S. from Limerick to the sea, 56 m. In its upper course it passes from its source in Cavan to Lough Allen in the county of Leitrim; thence through a difficult channel, where the navigation is in part transferred to a canal, to a small expansion called Corry Lough, and, with alternations of river and lake, to Lough Forbes, in the county of Longford, on leaving which the river for a time attains an average width of 250 yards as far as Lanesborough. Here it is again merged in a lake, Lough Ree, which stretches ten m. to within two m. of Athlone. At this point great natural difficulties have been overcome, and the course of the river, by Shannon Harbor and Portumna, and through the picturesque Lough Derg to Killaloe, has been so deepened and improved that regular passenger and goods traffic is maintained. From Killaloe to Limerick navigation, owing to the rapid fall, is again in part transferred to a canal Approaching Limerick the river divides into two branches, and on the island thus formed stands what is known as the Irish Town, in distinction from the English town, of Limerick. From the city, where an extensive and commodious range of quays has been built, to the sea, the S. is navigable to sea-going vessels; and though near the city very shallow at low water, the navigation for the last 40 m. is free at all tides. The entrance between Kerry Head and Loop is seven m. across. About ten m. from the entrance the river narrows to about a mile and a half in width. At present, however, the outward navigation commences at Foynes, which is connected by railway with Limerick, and from which steam-boats daily ply to Kilrush, Tarbert, and the intermediate stations. Several rivers of considerable size fall into the S. during its course, as the Suck, the Brosna, the Fergus, the Maigue, and the Feale. The improvement of the S. was begun under the Irish parliament. The navigation is open from the head of Lough Allen to Limerick, 143 m. in a direct course; but by the addition of the Boyle branch of 9 m. and the Strokestown branch of 6 m., a total length of river and canal navigation of 158 m. is now open, over 129 m. of which large river-steamers freely ply. This important system of navigation, midway between the e. and w. coasts of Ireland, is connected with Dublin by the Grand and Royal canals.

SHANNY, n. *shăn'nĭ* [etym. doubt.]: small fish allied to the Blenny (q.v.); the *Blennius pholis* of Linnæus, and the *Pholis lævis* of modern authors. It is about 4 in. long, olive-green, with irregular black spots. There is no crest-like appendage on the head, and the notched dorsal is not continuous with the caudal fin. The incisors are long, and serve to detach limpets and mussels from the rocks. It will endure fresh water for a short time, and will live for many days out of water where the ground is moist.

SHAN-SE, *shân-sē'* (West of the Hills): province of n.w. China, of rugged surface, on the w. limits of the plain. In the n. are imperial hunting-grounds. It supplies the purest iron ore and the best coal in China, besides cinnabar, copper, marble, and other minerals.

SHAN STATES, *shân*, or THE SHANS, *shânz:* tributary states in Indo-China, between Munnipur on the w. and Yun-nan on the e., and from the parallel of 24° n. lat., s. to Bankok and Cambodia. Of these the n. states are tributary to Burmah (q.v.) and the s. to Siam (q.v.). A great portion of the mountainous region of these states is called the Laos Country. The Laos races are divided into two curiously distinct sub-divisions. The n. race, beyond the n. frontier of Siam, are called *Black-bellies*, from the circumstance that they tattoo themselves with figures in ink, printed on their bodies with sharp needle-like points; the s. race, mostly on and within the e. frontier of Siam and tributary to that kingdom, are called *White-bellies*, and do not tattoo. Xieng Mai, cap. of Laos, stands on a wide plain on the right bank of the Meinam, 500 m. n. of Bankok, and is said to have pop. 50,000. The number of Laocians included in Siam alone is estimated at 1,000,000. They are meek, gentle, unwarlike, and superstitious. Their chief employment is agriculture; and the principal crops are rice, maize, sweet potato, calabashes, red pepper, melons, and other fruits. In religion they are Buddhists.

SHAN'T, v. *shănt:* a familiar corruption of *shall not.*

SHANTY, n. *shăn'tĭ* [said to be from Gael. or Ir. *sean*, old; *tig* or *tigh*, a house]: in *Ireland*, the name for a hut or hovel; a mean temporary building.

SHAPE, n. *shāp* [Icel. *skapa;* Dan. *skabe;* Dut. *schæpen*, to form: Norw. *skap*, form, shape]: form or figure of a thing; a mold or cast; pattern; form; external appearance; idea: V. to reduce to a particular form or figure; to fashion; to form; to adapt to a purpose; to regulate; to contrive; to direct; in *OE.*, to square; to suit. SHA'PING, imp.: ADJ. creating; giving form to; forming in the mind. SHAPED, pt. *shāpt.* SHAPEN, pp. *shā'pn.* SHAPE'LESS, a. *-lĕs*, destitute of regular form. SHAPE'LESSNESS, n. *-nĕs.* the state of being shapeless; want of any regular form. SHAPE'LY, a. *-lĭ*, symmetrical; well formed. TO TAKE SHAPE, to become embodied; to begin to take a definite form. SHIP-SHAPE, a. or ad. having the orderly arrangement of a ship; in good trim.—SYN. of 'shape, v.': to form; mold; cast; regulate; adjust; image; conceive; make; create; fashion.

SHAPINSHAY, *skăp'ĭn-shā:* one of the Orkney Islands, about 5 m. n.e. of Kirkwall; 5 m. long, 4½ m. in extreme breadth. The fine natural harbor of Elwick Bay on the s. side is overlooked by a pleasant modern village. Pop. (1881) 974.

SHARD, n. *shârd* [Dut. *schærde,* a breach, a piece of broken pottery: Low Ger. *skaard;* Ger. *scharte;* Icel. *skard,* a notch, a cut]: a broken piece of tile, or of some earthen vessel; the wing-cover of an insect; the shell of an egg or a snail: same as SCARD. SHARD'ED, a. sheath-winged, as a beetle. SHARD-BORNE, in *OE.*, borne through the air by sheathed wings.

SHARE, n. *shär* [AS. *scearu,* a share; *sceran,* to cut off, to divide: Low Ger. *scheren,* to separate, to tear away: Dan. *skære,* to cut]: a part or portion of a thing owned by several individuals in common; one of the transferable parts of a joint-stock undertaking, as a bank, a railway, etc.; an allotment; a portion; a part contributed; the sharp triangular piece of a plow immediately behind the colter, which cuts under the soil and raises up the furrow-slice cut off by the colter: V. to part or distribute among two or more; to partake of or enjoy with others; to have part, or a dividend; to experience. SHAR'ING, imp. SHARED, pp. *shärd.* SHAR'ER, n. *-ėr,* one who participates; one who enjoys or suffers in common with another. To GO SHARES, to be equally concerned. SHARE-BONE, in *anat.*, a bone at the upper and fore part of the pelvis; the pubis. SHARE-BROKER, n. *-brō'kėr,* a dealer in railway and other shares and securities. SHAREHOLDER, n. *-hōld'ėr,* one who holds one or more shares in a joint-stock company.

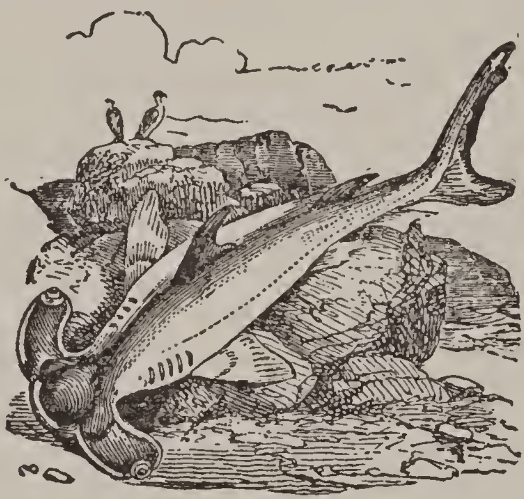
SHARI, *shâ'rē* [i.e., river]: principal feeder of Lake Tsad or Tchad (q.v.).

SHARJAH, or SHARJA, *shâr'jâ:* town, cap. of the province of S in Oman, Arabia; on the Persian Gulf; lat. 25° 20′ n., long. 55° 36′ e.; about 215 m. n.w. of Muscat or Mascat. Although S. has a poor harbor, it has commercial importance, Persia receiving most of her imported goods through it; and it is the principal place on the coast for sale of metals, cotton, wool, dromedaries, and asses, and the chief mart for the slave trade, in which a large part of the inhabitants of the province, which is virtually independent of the sultan of Muscat, is or has been engaged. There is a market-place in the town, in the centre of which stands the govt. treasury, a substantial building, carefully guarded. Many of the residents are weavers, manufacturing carpets, tapestries, cloaks and curtains, which with Indian and Persian goods are profusely displayed in the shops.—Pop. of province 85,000; of town about 25,000.

SHARK, n. *shârk* [Gr. *karcharias*, a shark—from *karcharos*, sharp-pointed: comp. Ger. *schurke*, a rogue: It. *scroccare*, to trick, to cheat, to live by wit: F. *escroquer*, to cheat, to swindle—*lit.*, one who clutches greedily after]: large voracious sea-fish of many species (see below): an artful fellow who lives by shifts and tricks; a greedy and rapacious one; one ready to seize every advantage; a sharper: V. to clutch greedily after; to live by shifts and petty tricks; in *OE.*, to pick up hastily or slyly. SHARK'ING, imp.: N. petty tricks or rapine; the seeking of a livelihood by petty tricks and devices. SHARKED, pp. *shârkt.* SHARKER, n. *shârk'ėr*, one who lives by sharking.

SHARK (*Squalus*): Linnæan genus of cartilaginous fishes, now forming in Müller's system a sub-order of *Plagiostomi* (q.v.), divided into a number of families and many genera. The sharks have generally an elongated form, tapering gradually to the tail, and not much thickened in the middle. The muzzle projects over the mouth; the nostrils are on the under-side of the muzzle. The males have claspers. The gill-openings are lateral. There is no cartilage between the snout and the pectoral fin, as in the rays. Some of the sharks are ovoviviparous; others lay eggs, generally a pair at a time, more being produced in succession. The eggs are large in comparison with those of osseous fishes, and are square or oblong, with a tough horny coat, each corner prolonged into a tendril, the tendrils being apparently of use for their entanglement among seaweeds. These eggs, or at least their empty cases, are frequently cast up by the waves on the sea-beach, and are popularly known as *Sea Purses* or *Mermaids' Purses*. Near the head of the inclosed embryo there is a slit in the case through which water enters for respiration, and there is another at the opposite end, by which it is discharged. The young fish ruptures the case at the head where it is weaker than at any other part, and on issuing from it, carries a yolk-bag attached to its belly for nourishment until it is able to seek food. At this stage of its existence, its respiration is aided by filaments projecting from the gills through the gill-openings, which are absorbed as it grows older. The teeth are generally large, sharp, and formed for cutting, with the edge often serrated; but in the genus *Cestracion* (q.v.) the teeth are pavement-like; and in some genera they are small and numerous. The Angel-fish (q.v.) is ranked among the sharks, but differs from the rest in its flattened form. Some of the smaller sharks are popularly known by the names Dogfish, Hound, Tope, etc. See CESTRACION: DOGFISH: FOX SHARK: HAMMER-HEAD: PORBEAGLE: TOPE. Here are noticed a few of the more interesting of those which do not come under any of these heads.

The WHITE S. (*Carcharias vulgaris*) is the most dreaded of all monsters of the deep. The family *Carcharidæ*, to which it belongs, have two dorsal fins, the first dorsal placed over the space between the pectoral and ventral fins; they have a nictitating membrane; and have no spout-holes. In the genus *Carcharias* the snout is flattened. The white S. attains great size; one has been caught 37 ft. in length. The body is covered with a hard skin, and is grayish-brown above and whitish below. It is found in the Mediterranean, and is plentiful in the seas of many warm parts of the world, often following ships to feed on any animal substance that may be thrown or may fall overboard, and often in its indiscriminate voracity swallowing things indigestible. A lady's work-box has been found in a S.'s stomach; and the papers of a slave-ship, which had been thrown overboard, in that of another. Human beings are frequently its prey; and a large S. is capable not only of biting off the limb of a man, but of snapping the body in two, and has been known to swallow a man entire. Its head is large, the mouth large and wide; furnished with a terrible apparatus of teeth, six rows in the upper jaw and four in the lower; the teeth are triangular, sometimes two inches in breadth, sharp-edged, and serrated; when not in use they are laid back in the mouth, nearly flat, but when the S. bites they are brought up—or at least those of the outer rows—by means of muscles with which each tooth is independently provided. The tail, as in all the sharks, is heterocercal, but its lobes are more nearly equal than in most of them. The S. is often captured by sailors, by means of a great hook baited with a piece of meat, and attached to a chain, as the S.'s teeth readily bite through any rope. When the S. is hooked and hauled on board,



Hammer-headed Shark (*Zygœna malleus*).

White Shark (*Carcharias vulgaris*).

great care is requisite to avoid danger both from the mouth and from the tail, the powerful action of the tail being usually interrupted by a sailor springing forward and cutting it above the fin with a hatchet. A curious method of catching the S. is practiced in the South Sea Islands; a log of wood is set afloat with a strong rope attached to it, at the end of which is a noose, and the sharks gathering about it as if from curiosity, one of them may be expected soon to get its head into the noose, and is at last wearied out by the log. Formidable as the S. is, men have sometimes successfully braved it in its own element, watching its turning—as from the position of its mouth it must do—to seize its prey, and stabbing it in the belly.

Among the species on the coast of the United States are ATWOOD'S S. (*C. Atwoodi*), 13–14 ft. in length, gray above and white beneath; the DUSKY S. (*C. obscurus*), 10–12 ft., brown above and brownish white beneath; and the SMALL BLUE S. (*C. cæruleus*), 3–6 ft., slaty blue above.

The BLUE S. (*Carcharias glaucus*) is much smaller than the White S., seldom exceeding eight ft. in length: it is also more slender. The upper parts are of blue color, the belly white. This species is common in the Mediterranean, and in warm parts of the Atlantic. It is frequent on the s.w. coasts of England in summer, apparently coming in pursuit of pilchards, and often doing great mischief to the nets and lines of fishermen, its sharp teeth biting through a net or line with ease.

The BASKING S. (*Selachus maximus*) belongs to the family *Lamnidæ*, having two dorsal fins, spout-holes, and no nictitating membrane. The snout of the Basking S. is short and blunt; the teeth are small, numerous, conical, and curved backward. The skin is much rougher than in the White S. and Blue Shark. This species attains great size, being sometimes 36 ft. long, but it is not so thick in proportion as the White Shark. It is of blackish-brown color, glossed with blue. It does not show ferocity, and is supposed to feed on medusæ, crustaceans, and the like. It is often seen swimming slowly with its dorsal fin above the surface of the water, whence it has obtained the name of *Sail-fish.* It permits itself to be quite closely approached by a boat, but on being struck with a harpoon, it plunges suddenly down, and swims off with great rapidity, so that its capture is attended with danger.

The GREENLAND S. (*Scymnus borealis*) is of the family *Scymnidæ.* It has large spout-holes, two dorsal fins, no anal fin, and no nictitating membrane. It inhabits northern seas, and is rarely seen so far s. as even the n. Scottish islands. It attains a length of 14 ft. or more, is thick, and tapers suddenly at the tail; the fins are very small; the teeth in both jaws so arranged as to diverge from a centre. It bites and annoys whales, but feeds also on small fishes and crustaceans. When a whale has been killed a S. will often come even while men are occupied in cutting off the blubber, and scoop out one great lump after another, and will return to its repast after having been severely wounded.

The rough skin of sharks is employed by joiners for polishing fine-grained wood, and for covering hilts of swords to make them firmer in the grasp.—The flesh is coarse but is sometimes eaten. The fins abound in gelatine, and are much used by the Chinese for making a rich gelatinous soup. Dried sharks' fins are a considerable article of import into China. The liver yields a large quantity of oil, which is now in some parts of the world an article of commerce. For the sake of this oil a S. fishery is prosecuted on the coast of Ceylon.

Fossil Sharks make their first appearance in the Oolitic rocks, from which eight species have been described. They become more numerous in the Cretaceous deposits, in which no less than 60 species have been found. In the Tertiary strata, their remains are still more abundant. But as the determination of fossil species depends entirely on the teeth, which, with the exception of the spines and vertebræ, are the only portions preserved, it is probable that the species and genera are too greatly multiplied.

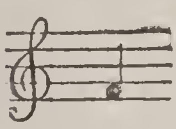
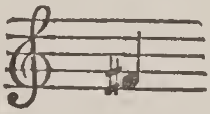
SHARKIE, n. *shâr'kĭ* [Port. *charque*, dried meat: F. *charcuterie*, spiced and partly cooked meat, as ham and sausage: comp. Gael. *searg*, dried up (see JERK)]: dried and preserved meat imported from S. America.

SHARON, *shăr'on:* post-borough in Mercer co., Penn.; on Shenango river, and on the New York Lake Erie and Western, the Erie and Pittsburgh, and the Lake Shore and Michigan Southern railroads; 41 m. s.s.w. of Meadville. It is noted for its iron mines and manufactures; has 3 rolling mills, 4 blast furnaces, brass foundry, boiler and machine shops, and nail factories; and contains gas-works, fire dept., high school, union public schools, opera-house, 1 nat. bank (cap. $125,000), 1 private bank, and 2 weekly newspapers. Pop. (1890) 7,447; (1900) 8,916.

SHARON SPRINGS, *shăr'on*, village and summer resort in Schoharie co., N. Y.; on the Delaware and Hudson Canal Co.'s railroad; 59 m. w. of Albany. It is surrounded by high hills and beautiful scenery; has chalybeate, magnesia, white sulphur, and blue sulphur springs; and contains 3 churches, and numerous hotels and boarding houses. Within easy reach is Tekeharawa Falls, in a secluded hemlock ravine; and 20 m. away by railroad is the remarkable Howe's Cave, now explored 7 m. Pop. (1890) 622; (1900) 567.

SHARP, a. *shârp* [AS. *scearp;* Icel. *skarpr;* Sw. and Dan. *skarp;* Dut. *scherp;* Ger. *scharf*, sharp: AS. *sceran,* to cut]: having a keen edge or a fine point; bent at an angle less than a right angle; acute of mind; of quick or nice perceptions; acid; pungent; shrill; not flat, as sounds; biting or piercing, as the wind; harsh, fierce, or severe, as words; severe, as an illness; characterized by keenness or severity; keenly attentive to one's own interest; unfair; severely rigid; vigilant; knavish; narrow; lean; hard, as sand: N. in *music*, a character which raises a note a semitone, and marked thus, ♯ (see below): V. in *OE.*, to render quick; to make keen; to mark with a sharp. SHARP'ING.

imp. Sharped, pp. *shârpt.* Sharps, n. plu. meal from which the flour has been sifted. Sharpen, v. *shârp'n,* to make sharp or keen; to render quick or eager; to make quicker of sense; to make eager or hungry; in *music,* to raise a note a semitone; to make sharp or acid; to become sharp; in *OE.*, to make fierce or angry; to make sour. Sharpening, imp. *shârp'nĭng.* Sharpened, pp. *shârp'nd.* Sharper, n. *shârp'ėr*, one who resorts to any means, however disreputable, of obtaining money; a tricky fellow; a cheat; a swindler. Sharp'ly, ad. *-lĭ.* Sharp'ness, n. *-nĕs,* keenness of an edge; acidity; pungency; severity of language; acuteness; painfulness; intellectual acuteness; ingenuity; wit; doubtful honesty. Double sharp, in *music,* a character which raises a note two semitones, and is marked thus, ×. Sharp-edged, having a fine keen edge. Sharp-set, eager in appetite or desire; affected by keen hunger. Sharp-shooter, n. a skilled marksman; formerly a term in the army for a rifleman; now, in naval usage, one of the men stationed in the top to pick off those on an enemy's deck. Sharp-shooting, n. a shooting with great precision; a keen contest of wit or argument. Sharp-sighted, having acute sight; shrewd; discerning. Sharp-visaged, having a sharp or thin face. Sharp-witted, having an acute and nicely discerning mind.—Syn. of 'sharp, a': keen; piercing; acute; witty; ingenious; inventive; quick; sour; acid; shrill; severe; harsh; biting; sarcastic; cruel; eager; hungry; painful; afflictive; fierce; ardent; fiery; attentive; vigilant; acrid; pinching; subtle; nice; hard; emaciated; lean; penetrating; sagacious; discerning; shrewd; tart; pungent; poignant; acrimonious; cutting; bitter; violent.

SHARP: sign ♯ in Music, which, prefixed to a note, elevates it by a semitone in the scale, raising, e.g., F  to F sharp . When placed at the beginning of a piece of music, it denotes that all the notes on the line or space on which it is placed, and their octaves above and below, are to be played sharp. A double sharp × raises a note two semitones.

SHARP, Granville: 1734–1813, July 6: English philanthropist and author: b. Durham; grandson of Abp. John S. He gave up his place in a war office, because opposed to the American war. In 1771 he brought before the lord mayor the case of a slave, claimed by a master who, two years before, had cast off the slave as sick and useless, after bringing him to London. The master not heeding the mayor's decision in favor of the negro, S. took the case to the court of king's bench, where it was decided 1772 that the slave was free. Among his pamphlets and book publications are—*Tract on Duelling* (1773); *The People's Natural Rights to a Share in the Legislature* (1774); *The Law of Liberty* (1776); *The Law of Retribution* (1776).

S. made repeated donations of books to Brown University. He died in London. See *Memoirs* by Charles Stuart (New York 1836).

SHARP, James: archbishop of St. Andrews: 1618, May—1679, May 3; b. in the castle of Banff, Scotland; son of William Sharp, sheriff-clerk of Banffshire. Educated for the Presb. ministry at the Univ. of Aberdeen, where he attained distinction as a student, and where he is said (on the authority of a tract, entitled *A True and Impartial Account of the Life of the Most Reverend Father in God, Dr. James Sharp, Archbishop of St. Andrews*, pub. 1719) to have protested against the 'Solemn League and Covenant;' he afterward visited England, and returning to Scotland, was appointed a prof. of philosophy at St. Andrews, and soon afterward minister of the parish of Crail, an office which he held during the ascendency of Cromwell. 1651, Aug., when Monk was reducing Scotland to obedience, he was carried off, with several other ministers, to England. S. quickly regained his liberty, and he possessed for some years the confidence of the more moderate party in the church. In 1656, he was chosen by them to plead their cause in London before the Protector, against the Rev. James Guthrie, leader of the extreme section (the Protestors or Remonstrators), which he did with so much dexterity, that Cromwell is reported to have said: 'That gentleman, after the Scotch way, ought to be termed Sharp of that Ilk.' On the eve of the Restoration S. was appointed by the moderate party its representative in the negotiations opened with Monk and the king, This is the crucial period of his career, and on the view that we take of his motives depends our whole estimate of his character. Was he sincere, or did he mean to betray the church to which he owed allegiance? Presbyterian writers are nearly unanimous in affirming his perfidy, though the evidence is doubtful. Among the first things that the Scottish parliament that met 1661, Jan. 1, did, was to repeal or rescind every act passed since 1638, in consequence of which Episcopacy remained the form of Church of Scotland, as 'settled by law'—a dishonorable evasion of a promise made by Charles in his letter to the Presbytery of Edinburgh 1660, Aug. Soon afterward at a council in Whitehall, S. was nominated Abp. of St. Andrews; and having gone up to London, he was there formally consecrated by the bp. of London and three other prelates. His government of the Scottish Church was tyrannical and oppressive; in consequence he became an object of hatred to most of his countrymen. When one Mitchell, a conventicle preacher, fired a pistol at him in the streets of Edinburgh, the populace allowed the intending assassin to walk quietly off, without making a single effort to arrest him. Finally S. was assassinated on Magus Moor, near St. Andrews, by a band of fanatical Covenanters. In defense of S., the utmost that can be said is that he was simply an ambitious ecclesiastic (of plausible and courtly manners), who had no belief in the 'divine right' of Presbytery, and who thought that if England were resolved to remain Episcopalian, it would be much better if Scotland were to adopt the same form of church-government; and that if there must be an abp. of St. Andrews, there was no reason why he should not be the person. This theory is certainly more sober than the usual melodramatic Covenanting view, which makes him out 'a conscious villian,' who persecuted his old friends the more fiercely that he knew they were in the *right* and he in the *wrong*.

SHARPIE, n. *shâr'pĭ:* long, sharp, flat-bottomed sailing-boat.

SHARPSBURG, *shârps'bėrg:* borough in Allegheny co., Penn.; on Allegheny river, and on the Pittsburgh and Western and the Pennsylvania railroads; 5 m. n.e. of Pittsburgh. As a suburb of Pittsburgh, it has many industrial interests in common with that city; and independently has rolling-mills, iron furnaces and foundries, glass-works, varnish and lubricating-oil factories. There are 7 churches, graded schools, 1 state bank (cap. $50,000), 2 weekly newspapers. Pop. (1890) 4,897; (1900) 6,842.

SHARPS'BURG, BATTLE OF: Confederate name for ANTIETAM, BATTLE OF (q.v.).

SHASTERS, n. *shăs'tėrz,* or SHAS'TRAS, n. *-trăz* [Hind. *shas,* to govern]: *literally,* ordinances; authoritative writings, or sacred laws or institutes, of the Hindus: see SASTRA: also SANSKRIT LITERATURE.

SHAT-EL-A'RAB: see EUPHRATES.

SHATTER, v. *shăt'tėr* [a form of SCATTER: Dut. *schetteren,* to crack, to scatter with noise: Swiss, *schattern,* to rattle like a heavy fall of hail]: to break into many pieces at once; to dash into fragments; to break up the unity or vigor of; to overthrow; to derange; to dissipate; to be broken into fragments. SHAT'TERING, imp. SHAT'TERED, pp. *-tėrd:* ADJ. broken or dashed to pieces. SHAT'TERS, n. plu. *-tėrz,* the fragments of anything broken or rent. SHAT'TERY, a. *-tėr-ĭ,* brittle; easily falling into many pieces. SHATTER-BRAINED, wild; disordered in intellect; scatter-brained.

SHATTUCK, *shăt'tŭk,* GEORGE CHEYNE: 1783, July 17—1854, March 18; b. Templeton, Mass. He graduated from Dartmouth Coll. 1803, and became a successful physician in Boston, and pres. of the Mass. Medical Soc. He built and equipped an observatory at Dartmouth Coll.; gave liberally to the Shattuck Prot. Episc. Collegiate School for boys at Faribault, Minn.; and at his death devised $60,000 for charitable purposes. He published essays on medical subjects.

SHAVE, v. *shāv* [Dut. *schaven,* to scrape: Dan. *skave;* Icel. *skafa,* to scrape: Ger. *schaben;* L. *scabĕrĕ,* to scrape, to scratch]: to cut or pare off something from a surface with any edged tool; to cut off close to the surface; to remove the growth of hair from the chin, etc., with a razor; to cut off thin slices; to strip; to fleece; to oppress by extortion; to skim along a surface: N. an edged tool used for shaving wood, as hoops, etc.; the act or process of removing the hair from the chin, etc ; in *Scot.*, a slice, as of bread. SHA'VING, imp. : N. the act of paring a surface ; a thin slice pared off with an edged tool. SHAVED, pt. pp. *shāvd*, or SHAVEN, pp. *shā'vn.* SHA'VER, n. *-vėr*, a barber. SHAVELING, n. *shāv'lĭng*, a monk, in contempt. SHAVING BRUSH, a brush used in lathering before shaving. A CLOSE SHAVE, *familiarly*, a narrow escape. SHAVEN AND SHORN, having clean-shaven face and closely cropped hair.

SHAVE, n. *shāv* [a familiar application of SHAVE 1] : in *slang*, a trick ; a piece of cheating or extortion : V. to cheat ; to raise a false claim wilfully ; to charge in excess of the regular price. SHAVER, n. *shā'vėr*, one who is close and sharp in bargains, or to his own interest ; a sharp dealer ; a cunning fellow ; a young man, in contempt. A YOUNG SHAVER, a sharp lad.

SHAVE'GRASS : see EQUISETUM.

SHAW, n. *shaw* [see SCHAW] : in *Scot.* and *OE.*, a wood or thicket. SHAWS, n. plu. in *Scot.*, the foliage of esculent roots, as potato-shaws.

SHAW, ALBERT, PH.D. : journalist : 1857, July 23—— ; b. New London, O. He received education at Iowa col. and at Johns Hopkins univ. He joined the editorial staff of the Minneapolis *Tribune* 1884, holding that position until 1891, when he became chief editor and manager of the American edition of *The Review of Reviews.* In 1888–9 he travelled extensively in Europe. Among his published works are : *Local Government in Illinois* (1883) ; *Icaria : A Chapter in the History of Communism* (1884) ; *Cooperation in a Western City* (1886) ; *The National Revenue* (1888) ; and *Municipal Government in Great Britain* (1895).

SHAW, HENRY WHEELER (pen-name JOSH BILLINGS) : 1818–1885, Oct. 14 ; b. Lanesborough, Mass. Starting out at the age of 15 in search of fortune he led an unsettled life for several years. He tried farming, running a steamboat on the Ohio, store-keeping and teaching, but was unsuccessful in all. He drifted back east and settled in Poughkeepsie, N. Y., 1858, as an auctioneer. His contributions to the newspapers, under the pen-name 'Josh Billings,' brought him liberal returns. His writings are characterized by a quaint shrewdness, and a humorous element intensified by the crude phonetic spelling which he adopted. He lectured throughout the country, and in addition to his sketches, issued in four vols., published an annual almanac. He died at Monterey, Cal.

SHAW, LEMUEL, LL.D : jurist : 1781, Jan. 9—1861, Mar 30 ; b. Barnstable. Mass. He graduated at Harvard Coll. 1800 ; was admitted to the bar 1804 ; served in the Mass. legislature 1811–15 and 1819 ; was a member of the convention for revising the state constitution 1820 ; member of the state senate 1821–2, 1828–9 ; and chief-justice of the Mass. supreme court 1830–60. He drew up the charter of Boston, and was a member of the Harvard corporation 27 years. His reported decisions fill about 50 vols., and he holds a foremost place among New England jurists.

SHAW, Richard Norman, R.A.: architect: b. Edinburgh 1831. While working at his profession in the office of Mr. William Burn, he studied at the Royal Acad., from which 1852 he received the silver medal and a special prize of books, and 1853 the gold medal; in 1854 he was elected the travelling student for two years. He is author of *Architectural Sketches from the Continent*, published soon after his return from his travels, and he has furnished the designs for a large number of important public and private buildings in England. In 1872 he was elected an associate of the Royal Acad., and 1878 an academician.

SHAW, Robert Gould: 1837, Oct. 10—1863, July 18. He was educated at Harvard Coll. At the breaking out of the civil war he entered the 7th N. Y. regt., but was transferred the next month to the 2d Mass. regt. He was promoted capt. 1862, and col. 1863 in command of the first regt. of colored soldiers from a free state. He was killed while leading his colored troops in the assault on Fort Wagner. Edmonia Lewis, the colored sculptor, has made his bust. This young officer, cultured and refined, is remembered as a type of heroic self-sacrifice, commending to public regard a previously derided line of action.

SHAW, Samuel: 1754, Oct. 2—1794, May 30; b. Boston. He was commissioned lieut., and served through the revolutionary war, reaching the rank of major; became chief clerk of the war dept. 1785; first U. S. consul to Canton 1786. He made several voyages between this country and China, and died at sea while returning to Boston. Josiah Quincy published his *Journal*, with sketch of his life (1847).

SHAWANESE, a. *shaw-wa-nēz'*, or Shawnese, a. *shaw-nēz'*: of or belonging to the Shawnees, a tribe of N. American Indians.

SHAW'FOWL, n. [*shaw*, a form of *show*]: an artificial fowl made by fowlers to shoot at.

SHAWANGUNK, *shŏng'gŭm*, Mountains: a range belonging to the Appalachian system, in the s.e. part of N. Y., in Orange, Sullivan, and Ulster cos.; height about 2,000 ft. The rocks and lakes of this region are in many places startlingly picturesque.

SHAWL, n. *shawl* [F. *châle;* Pers *shâl*, a shawl]: large piece of cloth of various textures and degrees of fineness, worn over the shoulders and around the person by females; an article of dress worn in the East by both sexes in various ways. Shawled, a. *shawld*, wrapped up in or covered with, a shawl.—The *Shawl* is an important article of eastern manufacture. Perhaps no garment is of higher antiquity; indeed, its simplicity of form would lead us to infer that it was the earliest in use. But of its manufacture we have no distinct account until the reign of Emperor Jelal-ed-din-Mohammed Akbar, 1556, when the celebrated Cashmere shawls were among the most important manufactures of the world, and were thought worthy to be minutely described in the *Ayin-i-Akbari*, or 'Institutes of the Emperor.' In that work, four distinct classes of shawls, all of goat's wool, are described. The 1st were of remarkable lightness and softness, usually self-colored, and made of the wool undyed; the 2d were woven of wool in the natural colors—viz., white, black, and gray—these were probably arranged to form a plaid pattern similar to the shepherd's plaid of Scotland, which is of oriental origin; the third were called *gold-leaved*, probably from being embroidered with that material; and the 4th were long shawl-pieces large enough to enwrap the whole body. So carefully was this manufacture fostered, that it received the chief attention of the emperor, and every shawl manufactured was carefully described and registered; and the number of manufacturers was so great that in Lahore alone it is stated there were more than 1,000. The manufacturer, in later times, passed through many vicissitudes, and during the 18th c. it declined greatly; but in 1809 it had again risen and there were then about 16,000 looms at work. From 2,000 to 3,000 of these beautiful fabrics have been annually imported into Great Britain; but the admirable imitations now produced by the Paisley manufacturers, and by the French, are exerting great influence over the trade. The true Cashmere shawls are woven in many pieces, and joined together with great artistic skill; those of Britain and France are woven in one piece, the loom being worked by hand, and of course furnished with a Jacquard machine for production of the pattern. Besides the Cashmere shawls and their European imitations, there is an infinite variety of shawls made of various materials—as silk plain, embroidered, and in the form of crape; thread, cotton, and silk lace; and wool in numerous styles.

SHAWM, or SHALM, n. *shawm* [OF. *chalemie*, a pipe made of a reed: F. *chaume*, a straw—from L. *calamus*, a reed]: a loud-sounding instrument made of a ram's horn; a musical instr. resembling the clarionet; the Prayer-book word for *cornet* in Ps. xcviii. 6, A. V.

Shawm.

SHAWNEES, *shaw-nēz′*: tribe of Algonquin Indians, recently identified with the Kickapoos. The first traces of them are found on the Fox river, Wis., 1648. They travelled s. and e., and, driven before the Iroquois, settled along the Cumberland river, whence some roamed to N. C. and Fla. One band settled in Penn., and was a party to the treaties with Penn 1682 and 1701. The Fla. bands returned n., and in N. C. were known as the Savannahs or Yemassees. Afterward most of the S. were driven west, and are found on the Scioto and in Mo. They were on the side of the French in the early struggles, took part in Pontiac's war, and were leaders in the confederacy of tribes that fought at Point Pleasant 1774. After the revolution, incited by the English, they kept up hostilities in the west till subdued by Gen. Wayne, when they joined in the treaty of Greenville, 1795. The Shawnee chief Tecumseh attempted a confederation of the northwestern Indians against the whites, but his plans were defeated by

Gen. William H. Harrison in the battle of Tippecanoe. In the war of 1812 Tecumseh aided the British. The Ohio S. took no part in the war. In 1831 they sold their lands, and with the Missouri bands settled on a reservation in what is now Kansas. Their tribal relations were dissolved 1854. In 1890 there were 79 S. in the Quapaw agency, Ind. Terr., and 640 in the Sac and Fox agency, Oklahoma. They have become fairly civilized under missionary labors.

SHAYS'S REBEL'LION, *shāz'ĕz:* uprising in western Mass. 1786–7, named from Daniel Shays, who had served at Bunker Hill and been a capt. in the revolutionary war. There had been a growing discontent in the state since 1782, with outbreaks in some counties against the courts. It was claimed that taxes were too severe, the lawyers extortionate, and the senate aristocratic; and the malcontents demanded the issue of paper money, and the removal of the general court from Boston. Shays appeared as their leader first at the head of 1,000 men, who attempted to prevent the session of the supreme court at Springfield, and at the head of a similar outbreak at Worcester, 1786, Dec. The following month an attempt was made to capture the arsenal at Springfield. The militia had warning of Shays's approach, and he was repulsed, with three men killed. The insurgents retreated through South Hadley, and were overtaken two miles beyond Petersham, 150 taken prisoners, and the rest dispersed. Some of the leaders were sentenced to be hanged, but were afterward pardoned. Shays sought refuge in Vt. for a year, but was then pardoned at his own request, and removed to Sparta, N. Y., where he died.

SHE, pron. *shē* [AS. *seo,* fem. of *se,* used as def. article: Ger. *sie;* Skr. *sa,* she]: the nom. fem. of the pron. of the third person, applied to females only, or things personified in the fem.; as a prefix—a female, as she-bear: N. in *OE.*, a woman, usually with some degree of humor or contempt.

SHEA, n. *shē'ă* [a native name]: tree of tropical Asia and Africa, from whose nut a sort of butter or solid oil is obtained; the butter obtained from the *Bassĭa Parkĭī*, ord. *Sapotācĕæ:* see BASSIA.

SHEA, *shā,* JOHN GILMARY, LL.D.: R. C. historian: 1824, July 22—1892, Feb. 22; b. New York; son of the principal of Columbia Coll. Grammar School, where he was educated, afterward studying law. He was editor of the *Hist. Mag.* 1859–65; first pres. of the Rom. Cath. Hist. Soc. of the United States; and has published very numerous works, among which are: *Discovery and Exploration of the Mississippi Valley* (1853); *Hist. of the Cath. Missions among the Indian Tribes* (1854); *Early Voyages up and down the Mississippi* (1862); *Novum Belgium* (1862—New Netherlands in 1643–4); *Hist. and Description of New France* (1866–72, 6 vols); *Life of Pius IX.* (1875); *Hennepin's Description of Louisiana* (1880); *Le Clercq's Establishment of the Faith* (1881); *Penalosa's Expedition* (1882); *Cath. Church in Colonial Days* (1886); *Cath. Hierarchy in the United States* (1886); *Life and Times of Archbishop*

Carroll (1888): also translated De Courcy's work on the Amer. Rom. Cath. Church; and edited the Cramoisy series of documents relating to French-Amer. colonies, and other works. Besides these are 15 vols. of grammars and dictionaries of Indian languages, many school-books, revisions of Rom Cath. Bibles and prayer-books, etc. His last work, 1891, Oct., is *Father Junipero Serra*, 1713—1784, *and the Franciscan Missions in California.*

SHEADING, n. *shēd'ĭng* [AS. *sceadan;* Goth. *skaidan*, to separate, to divide]: one of the six divisions or districts of the Isle of Man.

SHEAF, n. *shēf*, plu. SHEAVES, *shēvz* [Dut. *schoof;* Icel. *skauf;* Ger. *schaub*, a bundle of straw: Gael. *sguab;* W. *ysgub*, a sheaf of corn]: a quantity of grain in the stalk tied together in a bundle after it is cut in the field; any bundle or collection, as a *sheaf* of arrows: V. to collect and bind in sheaves. SHEAF'ING, imp. SHEAFED, pp. *shĕft.* SHEAFY, a. *shēf'ĭ*, resembling, or consisting of, sheaves. SHEAVED, a. *shēvd*, in *OE.*, made of straw.

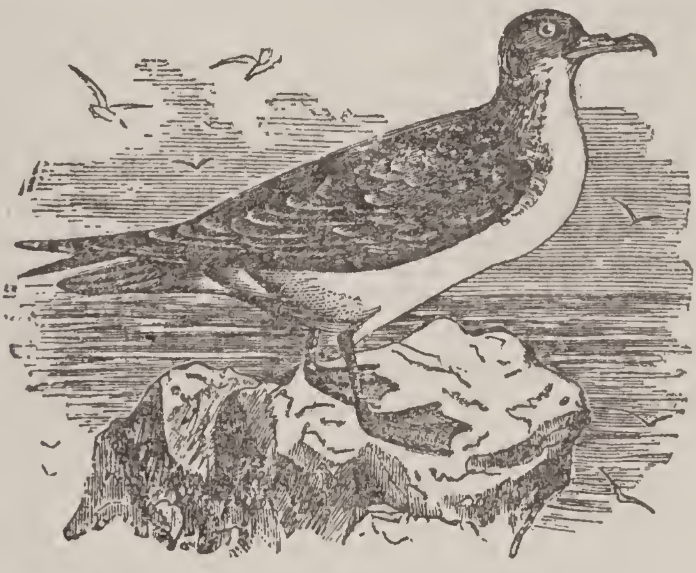
SHEAL, v. *shēl* [Ger. *schale*, a shell (see SHELL)]: in *Scot.* and *OE.*, to separate the parts; to shell: N. a husk; a pod. SHEALED, a. *shēld*, shelled. SHEAL'INGS, n. plu. *-ĭngz*, the outer husks; pods or shells.

SHEAL, n. *shēl*, or SHEALING, n. *shēl'ĭng* [Icel. *skjol*, shelter; *skyla*, to screen, to shelter: Gael. *sgàile*, shade]: a hut for shepherds, fishers, etc.; a shed for sheltering sheep; also spelled SHEEL, SHEIL, SHIEL, and SHIELING.

SHEAR, v. *shēr* [Ger. *scheren*, to shear, to clip: Dut. *scheren*, to tear: Icel. *skera;* Dan. *skære;* Scot. *shear*, to cut, to reap corn (see SHARE)]: to cut or clip from a surface with shears or scissors, as wool from sheep, or the nap upon cloth; to fleece; in *Scot.*, to reap, as corn. SHEAR'ING, imp.: N. the act or operation of clipping or shearing by shears or by a machine. SHEARED, pt. *shērd*, or SHORE, pt. *shōr*, did shear. SHEARED, or SHORN, pp. *shōrn.* SHEAR'ER, n. *-ėr*, one who shears. SHEAR'LING, n. *-lĭng*, a sheep only once sheared. SHEAR'MAN, n. one whose occupation is to dress or shear cloth. SHEARS, n. plu. *shērz* [AS. *sceara;* Ger. *schere*, shears]: cutting instr. of two blades which move on a pivot and act against each other: in gardening, they are scissors on a large scale, variously modified for various purposes, e.g., pruning trees, hedges, box-edgings, verges of grass-plots, etc. They are often furnished with long wooden handles, and a spring is sometimes fixed between the handles. A kind used for removing small branches of fruit-trees has one blade made to slide along the other while they are brought together, so that it makes a cut as clean and smooth as that of a knife.—The name is given to anything in the form of shears, or which acts as shears; also two or more long pieces of timber whose ends are fastened together at the top, but spread at the bottom, used when furnished with tackling to raise heavy weights; in *OE.*, wings. SHEAR'BILL, a certain fowl, called the black-skimmer or cut-water. SHEAR-STEEL, a kind of steel made of welded bars drawn out and tempered (see IRON). SHEARING MACHINE, machine used in preparation of woven woolen fabrics (see WOOLEN MANUFACTURE).

SHEARD, n. *shĕrd* [for SHARD, which see]: in *OE.*, a fragment, as of earthenware.

SHEAR'WATER (*Puffinus*): genus of *Procellaridæ* (see PETREL) differing from petrels in having the tip of the lower mandible curved downward, and the nostrils opening separately and not by a common tube. The bill is as long as the head, or longer, the upper mandible compressed and curved at the point. The legs are of moderate length, the tarsi compressed; the hind-toe is rudimentary. The wings are long and pointed. The shearwaters spend their lives mostly on the ocean, rarely visiting the shore except for incubation.—The GREATER, WANDERING, or CINEREOUS S. (*P. cinereus* or *major*) is about 20 inches long, the upper parts brownish ash; the throat, breast, and belly gray: the young are entirely brown, the upper parts darkest. This species is frequently seen on the coasts of Europe, and from Newfoundland to Florida.—The MANX S. (*P. Anglorum*) is common on the Orkney and other northern islands, and frequents the Amer. coast from Labrador to N. J.: it is about 15 in. long, black, the neck mottled with gray, throat and all the under-parts white. It breeds on islets, in rabbit-burrows, or in crevices of the rocks.—There are several other species in warmer climates. —The name S. is sometimes given also to the Skimmers.



Manx Shearwater (*Puffinus Anglorum*).

SHEATH, n. *shēth* [AS. *scæth;* Ger. *scheide;* Dan. *skede;* Icel. *skeidir*, a sheath: Sw. *skida*, a shell]: a case for a sword or like instrument; a scabbard; the wing-case of an insect; in *bot.*, a petiole when it embraces the branch from which it springs, as in grasses. SHEATHE, v. *shēth*, to put into a scabbard or case; to protect with any exterior covering or membrane; to cover with sheets of copper, etc., as a ship's bottom. SHEATH'ING, imp.: N. the casing or covering of a ship's bottom (see below). SHEATHED, pp. *shēthd*. SHEATHER, n. *shēth'ėr*, one who sheathes. SHEATHY, a. *shēth'ĭ*, forming a sheath or case. SHEATH'LESS, a. *-lĕs*, without a case or covering. SHEATH-WINGED, a. *wĭngd*, having cases for covering the wings, like the beetle.

SHEATH'-BILL (*Chionis*): genus of birds of family *Chionidæ*, placed by many naturalists among the *Grallæ*, but by others regarded as belonging to the *Gallinaceous* order, and ranked by Swainson among *Columbidæ*. The legs are stout and moderately long; the toes much resemble those of the common fowl, but the fore-toes are united at the base. The bill is thick and conical, and the base is covered by a horny sheath, which the bird has the power of raising and depressing. The WHITE S. (*C. alba*) inhabits the shores of Australia, New Zealand, and neighboring islands, and feeds on mollusks, crustaceans, and whatever animal substance is thrown up by the waves. It is about the size of a partridge, white, with bill and wrists black.

SHEATH'ING: protection for the wooden planking of the immersed portion of a ship from the attacks of the teredo and other worms, mollusks, and marine animals, which, especially in hot climates, adhere to the bottom and eat into the timber, and retard the vessel's progress. As early as the time of Trajan, sheets of lead were used as sheathing. Thin deal boards, about half an inch thick, were in more modern times nailed on and frequently changed; but about the beginning of the 19th c. plates of copper were introduced, which have been found effectual, though expensive. The gradual oxidation of the copper by the action of the sea-water produces a sort of poison, which prevents any marine animal from adhering, and keeps a clean bottom. The copper, however, slowly wears away in this oxidation, and requires renewing after a few years. To prevent this loss, various methods have been devised. Sir H. Davy applied what he called protectors, consisting of pieces of iron and zinc on different parts of the *copper;* the action of the water on the two metals produced a small galvanic current, which prevented the copper from oxidizing; but it became forthwith incased in barnacles and weeds. For ships stationary in harbor, as hulks, ships-in-ordinary, etc., this system of protection suffices; but it fails for sea-going vessels, together with many other protecting mixtures which have been tried, from the fact that, in proportion as the copper is saved from oxidation, by so much does it cease to repel the incrustations which always threaten it.

SHEAVE, n. *shēv* [Dut. *schijf*, a disk, a wheel: Low Ger. *schive*, anything round and flat: Ger. *scheibe*, a wheel or pulley: Icel. *skifa;* Dan. *skive*, a slice, a sheave: Icel. *skifa*, to split, to cleave (see SHIVER)]: wheel or circular disk on which the rope works in a block (see PULLEY). SHEAVE-HOLE, a channel cut in a mast, a yard, etc., in which to fix a sheave.

SHEAVED, a. *shēvd* [from SHEAF, which see]: in *OE.*, made of straw. SHEAVES, n. plu. *shēvz:* see SHEAF.

SHE BA: see SABEANS (dwellers in Yemen).

SHEBEEN, n. *shĕ-bēn'* [Irish]: a place where spirits and other excisable liquors are illegally and privately sold. SHEBEEN'ING, n. the practice of keeping a shebeen.

SHEBOYGAN, *shė-boy'gan:* city, cap. of Sheboygan co., Wis.; on Lake Michigan, at mouth of Sheboygan river, and on the Milwaukee Lake Shore and Western and the Chicago and Northwestern railroads; 43 m. e. of Fond du Lac, 52 m. n. of Milwaukee. It was settled by Germans 1836, and has become a noted manufacturing place. Its excellent harbor encourages a large shipping trade, especially in flour, grain, and lumber; it has a co. courthouse, 20 churches, public high school, gas and electric light plants, street railroads, water-works, several public parks, 2 state banks (cap. $300,000), several hotels, 3 daily and 5 weekly newspapers; and it manufactures leather, foundry and machine-shop products, beer, chairs, furniture, stoves, builders' wood materials, and stoneware. Pop. (1880) 7,314; (1890) 16,359; (1900) 22,962.

SHE'CHEM, or SI'CHEM, or SY'CHAR: see NABULUS, or NABLUS.

SHECHINAH, or SHEKINAH, *shē-kī'nâ* [Heb.—from *shachan*, to reside, rest]: a word used in post-biblical times by the Jews, and adopted by early Christian writers: expressive of the visible symbol of the Divine Presence, in Heaven, or among the people of Israel, or in the Sanctuary, where, as a cloud of glory or suffused light, it rested over the mercy-seat. The word is found first in the Chaldee versions (Targums) as a kind of periphrasis for the person of God, wherever it is mentioned in the Bible as corporeal: thus being a kind of spiritual interpretation of anthropomorphism. The S. is not supposed to have dwelt in the second temple, but it is to return with the Messiah. The first mention of the word is in the Targum Jerushalmi, Gen. iii. 24—'And he expelled Adam, and caused to reside the splendor of his Shechinah from the beginning at the east of the garden of Eden, above the two cherubim.' (Second recension: 'between the two cherubim.') Another characteristic instance of its use is found in the version of Onkelos, Deut. iii. 24—'Thou art God, Thy divine Shechinah is in Heaven above, and rules on earth below.'

SHED, n. *shĕd* [Dut. *schutten*, to ward off, to hedge: Norw. *skuta*, to project; *skut*, a shed formed by the projecting roof of a house: Icel. *skuti*, shelter given by a projecting rock]: a temporary building of wood for shade or shelter; a hut; a hovel; a penthouse or shelter of boards.

SHED, v. *shĕd* [Low Ger. *schudden*, to shake: Bav. *schütten*, to shake, to spill: Gr. *skedannumi*, I scatter]: to pour out; to spill; to let fall; to scatter; to diffuse; to throw off, as a natural covering. SHED'DING, imp.: N. act of scattering; that which is cast off or out. SHED, pp. *shĕd*. SHED'DER, n. *-dėr*, one who or that which sheds or spills.

SHED, v. *shĕd* [Ger. *scheiden;* Goth. *skaidan;* AS. *sceadan*, to separate, to divide]: in *prov. Eng.* and *Scot.*, to divide or part the hair, generally along the crown; in *Scot.*, to separate or part the lambs from their dam: N. the natural flow of waters, separating hither and thither, from the high lands to the lower, as in water-*shed*. SHED'DING, imp.: N. the parting of the hair. SHED, pt. pp.

SHEDD, *shĕd*, WILLIAM GREENOUGH THAYER, D.D., LL.D.: 1820, June 21—1894, Nov. 17: theologian; b. Acton, Mass. He graduated at the Univ. of Vt. 1839, and at the Auburn Theol. Sem. 1843. In 1844 he became pastor of the Congl. church in Brandon, Vt.; 1845 prof. of Eng. literature in the Univ. of Vermont; 1852 prof. of sacred literature in the Auburn Theol. Seminary; 1853 prof. of ecclesiastical history and lecturer on pastoral theology in Andover Theol. Seminary. In 1862 he became associate pastor of the Brick (Presb.) Church, New York; 1863 prof. of biblical literature in Union Theol. Seminary, New York; 1874 was transferred to the chair of systematic theology, which position he retained until 1890, when he became prof. emeritus in this seminary. He had published a translation from the German of Theremin, *Eloquence a Virtue* (1850; 2nd ed. 1859); and of Guericke's *Manual of Church History*, 2 vols. (1860–70); and is the author of *A History of Christian Doctrine*, 2 vols. (1865; 8th ed. 1884); *Homiletics and Pastoral Theology* (1867; 8th ed. 1884); *Sermons to the Natural Man* (1871; 3rd ed. 1884); *Theological Essays* (1877); *Literary Essays* (1878); *Commentary on Romans* (1879); *Sermons to the Spiritual Man* (1884); *The Doctrine of Endless Punishment* (1886). Dr. S.'s *History of Christian Doctrine* has gained very high repute for learned research, logical force, and felicitous expression, though his position is that of a strong upholder of a rigid type of Calvinism.

SHEEL, n. *shēl*, and SHEEL'ING, n., see SHEAL 2.

SHEEN, n. *shēn* [AS. *scyne*, bright, clear: Dut. *schoon;* Ger. *schön*, beautiful]: brightness; splendor: ADJ. in *OE.*, bright; glittering; showy. SHEENY, a. *shēn'ĭ*, bright; shining.

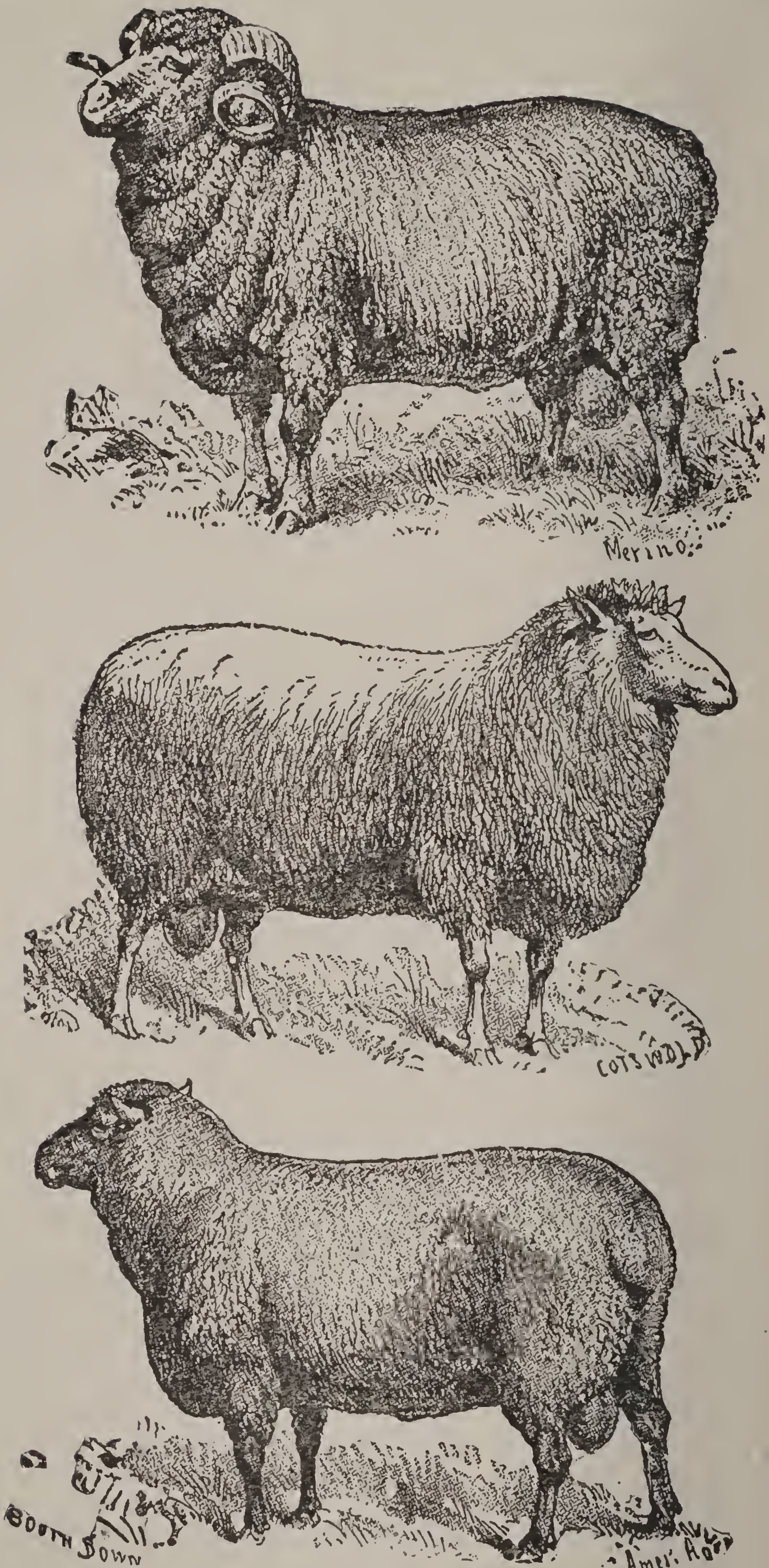
SHEENY, n. *shēn'ĭ: colloq.* [etymology doubtful; possibly from Fr. *chien*, dog, originating in the days of the Norman persecution of the Jews in England]. A slang and opprobrious term applied to Jews; sharp fellow looking out for some one whom he can cheat, or with whom he may make a sharp bargain.

SHEEP, n. *shēp* [Dut. *schaap;* Ger. *schaf,* sheep: Bohem. *skopec;* Pol. *skop,* a wether or castrated sheep—from Pol. *skopiti,* to castrate]: domestic ruminant quadruped, covered with wool (see below): *familiarly,* one who is foolishly modest and backward: in *Scrip.,* a term applied to God's people, indicating their relation to Christ the Good Shepherd. SHEEP'ISH, a. *-ĭsh,* very bashful; overmodest; meanly diffident. SHEEP'ISHNESS, n. *-nĕs,* the quality of being sheepish; excessive modesty or diffidence. SHEEP'ISHLY, ad. *-lĭ.* SHEEP'S-BIT, a blue flower, the *Jasīonĕ montāna,* ord. *Campanulācĕæ.* SHEEPCOTE, a small inclosure or pen for sheep. SHEEP-DOG, a valuable variety of dog, trained to watch and turn sheep; a collie. SHEEP'S-EYE, a diffident loving look. TO CAST SHEEP'S EYES, to look furtively, as a bashful lover does at the object of his affection. SHEEP-FOLD, a place where sheep are confined. SHEEP-SHANK, among *sailors,* a peculiar knot made to shorten a rope. SHEEP-SHEARER, one who shears sheep. SHEEP-SHEARING, the act of shearing sheep. SHEEPSKIN, the skin of a sheep, or the leather prepared from it. SHEEP'S SORREL, a herb, growing naturally on a poor gravelly soil. SHEEP-STEALING, in *English law,* a felony; in *Scotch law,* a capital offense, though for some time the death-penalty has not been inflicted. SHEEP-TICK, an insect which infests sheep (see SHEEP). SHEEP-WALK, a place where sheep feed. CLAD-SHEEP, sheep with their full fleece upon them ready for shearing. *Note.*—The *ram* or *tup* is the male or sire; the *ewe,* the female or dam; the *lamb,* the young sheep; the *hogget,* a weaned lamb; a *wether* or *wether-hogget* is a castrated male or tup; after the first fleece is shorn, the male is a *shearling,* the female a *gimmer,* and the wether a *dinmont.*

SHEEP (*Ovis*): genus of quadrupeds, ruminant, with hollow horns, of family *Capridæ,* and very closely allied to the goat. It varies from the latter in being larger, in having a more convex face and spiral horns (the latter lacking in many domestic breeds), in being without a beard, and in various other characteristics. It is more timid than the goat, and has changed more under domestication. It is quite strong and climbs steep hills, and even rugged mountains, with facility. Its legs are small; its hair is of two kinds, one of which, the inner and softer, is known as wool (see WOOL) and in the domestic S. forms the principal covering; and its hoofs are horny and separated like those of the ox. It has 12 molar teeth in each jaw, and 8 incisors in the under, but none in the upper jaw. Except the outer incisor on each side, which appears in the fourth year but does not become fully developed for several months, the S. has all its permanent teeth when three years old. By some naturalists the genus is divided into 21 species, but a few classify these species under four genera. In the wild state S. are widely distributed, and the domestic S. is found in almost all regions inhabited by man.

There are several wild species. Of these the musimon (*O. Musimon*) is found in Corsica, Sardinia, and mountainous regions of European Turkey. It is, like other wild spe-

PLATE 7.



The principal breeds or Sheep.
(From the American Agriculturist, by permission.)

cies, apparently intermediate between the S. and the goat, but breeds with the domestic S., and considerable numbers have been domesticated. Somewhat resembling this is the argali (*O. Ammon*), found wild in the mountains and on the elevated plains of central and n. Asia. These S. are readily domesticated and are esteemed for their flesh and their skins. The African argali (*O. Tragelaphus*) is a large and bearded S., found in the more elevated regions of n. Africa. (See ARGALI.) The Rocky Mountain S. (*O. Montana*) is found in small flocks in the n.w. United States, on the most craggy parts of the Rocky Mts. From the enormous size of its horns it is often called the Bighorn sheep. Its flesh is of the very finest. From which, if either, of the existing wild breeds the domestic S. is descended is unknown. See MOUFFLON.

Rocky Mountain Sheep.

All the wild sheep known are natives either of mountainous regions or of dry and elevated tablelands. They are gregarious, a character which the domesticated sheep fully retains. They are seen usually in small flocks, and are not easily approached, taking refuge in flight, a sharp whistling sound, emitted by one of the rams, serving as an alarm to the whole flock; though they are capable of making a vigorous defense when driven to close combat. A ram of the domestic species is, indeed, able to sustain a conflict with a bull, taking advantage of his far greater agility, and butting against his foe with his strongly armed forehead. Many rams show great pugnacity. Sheep differ from goats in their mode of fighting. Goats rear themselves on their hind-legs, and throw themselves sideways on their adversary, to bring the points of their horns to bear. Sheep rush straight at each other, a mode which better suits the different style of armature of the head. Rams of the black-faced variety are especially powerful with their heads, and often at the rutting season kill each other. Their naturally strong skull is considerably protected in battle by heavy arched horns. Ewes of this breed also fight. Sheep without horns are not so pugnacious as the mountain breeds.

All the wild sheep have short wool, with an outer clothing of long and nearly straight hair. But even the long hair—at least on the Moufflon—has the peculiar character of wool, in that roughness of surface which gives it the property of *felting* (see Hair and Felt). One effect of domestication in the common sheep has been to cause the disappearance of the outer long hair, and to produce instead an increase of the length and abundance of the wool, an object of great importance to the sheep farmer. In neglected breeds of the common sheep, the two kinds of hair or wool are very apparent. In some tropical climates, the sheep loses its abundant fleece, and is covered with hair little longer than that of the ox.

Although not equal to goats in adaptation to rocky steeps, and without such power of leaping from crag to crag, most breeds of sheep tend to seek their food in places where no animal not agile and surefooted would venture; and those of the domesticated breeds which retain much of their original wildness are thus adapted to situations in which otherwise the pasture would be of little value to man. One who has seen the lambs frisking on a Highland hill, in a fine evening, must have admired their nimble movements in places where a herd-boy could with difficulty scramble. In fine weather, sheep ascend the heights; and in cold and stormy weather, they repair to the lower grounds. In modern times it has been customary to remove the large flocks from mountainous regions to lower grounds to pass the winter; and in the fall of the year, shepherds have difficulty in preventing the animals from leaving the summer pastures too early if the weather is unfavorable. On the other hand, if fine spring weather sets in before the period of removal from the winter quarters, the flocks keep pressing toward the summering regions. Mountain sheep have favored spots whither they go regularly over-night, and the ewes generally have choice localities to which they go to lamb. Sheep grow attached to certain pastures, and they have been known to return stealthily, in the course of a few days, to their native or appreciated pastures, though removed hundreds of miles.

The Common Sheep (*O. aries*) was probably the first animal domesticated by man. Sheep formed a large proportion of the property of the patriarchs, some of whom had immense flocks; and many noted men of ancient times were shepherds. Ancient writers, sacred and profane, made frequent references to S. and to their use in religious sacrifices and festivals. With increase of civilization the keeping of S. has been widely extended, and as agriculture has improved, the value of these animals has become more apparent. The Spaniards have an old proverb that 'The hoof of the sheep is golden,' and long ago sheep husbandry was pronounced by observing writers the 'sheet-anchor of English agriculture.' So highly were S. valued about the time of Queen Elizabeth that stringent laws were passed to prevent their exportation, which had previously been allowed. Any one convicted of sending S. out of the country was for the first offense, condemned 'to forfeit his goods forever, to suffer a year's imprisonment, and then have his left hand cut off in a market-town on market-day, there to be nailed up to the pillory.' For a repetition of the offense it was ordered that 'he should be adjudged a felon and suffer death.' There were also, at various times, restrictions on export of wool.

Those who watch sheep carefully, or keep them as pets, find them not devoid of intelligence. They have, however, a stupid habit of following, without scruple, the leader of the flock; so that, when sheep are being driven across a narrow bridge, or where a fence separates the road from a precipice, if anything occur to deter them from proceeding in the proper path, and one break over the fence or parapet, more of the flock may be expected to follow, as has sometimes happened, to their utter destruction. Sheep soon come to know the voice of the shepherd, also the appearance and the bark of the shepherd's dog.

The S. matures at an early age, and makes quick return for the capital invested—a quality which has often been pushed to an extreme. The ewe should not drop her first lamb till she is about two years old, and in the late-maturing breeds not till she is three years old. The period of gestation is about 21 weeks. The ewe brings forth one, frequently two, rarely three, lambs at a birth. Although, if well cared for, they live to a greater age, S. should not be kept for breeding purposes after they are 8 or 9 years old; and unless they are exceptionally valuable, it is not profitable to keep them for any purpose until they reach this age. If the best results are to be obtained, the males must be of pure blood. The better the breeding of the ewes, and the more careful their selection in respect to size, constitutional vigor, symmetry of form, and quantity and quality of wool, the higher will be the standard which the flock will attain. The use of grade rams, the indiscriminate crossing of pure breeds, or breeding from stock in any wise inferior, will surely and rapidly cause deterioration in the character of the flock. But a proper selection of the stock, and a careful attention to the principles of breeding, will, with equal certainty, secure and maintain excellence. The ewes should be kept tame, so that they can be easily handled, but the rams should never be either teased or petted, as either course will be sure to make them cross and dangerous.

S. naturally prefer uplands, but can be kept without difficulty in drained lowland meadows or pastures. Wet, marshy soils are decidedly unfavorable. S. will eat not only the finer grasses, but will also crop much of the coarser herbage of the fields in which they are confined. When the quantity of grass is limited, they will eat also many weeds and briers, and they are sometimes kept largely with a view to eradication of these pests But the better the pastures, the more rapid and uniform will be the gain which the flock will make. The same principle holds in winter feeding. Rowen hay is much better, especially for breeding ewes and lambs, than that of the first crop, and fine hay for them is much superior to the coarser kinds. The addition of from a gill to a pint of corn or oats per day, or its equivalent in oil-meal or Indian meal, will be highly beneficial. Turnips, beets, or carrots also have important place among the materials for winter feeding. All marked changes in the kinds of food given to S. should be made gradually, and a liberal standard, both as to quantity and quality, should be constantly maintained. Variations from high to scant feeding, or the reverse, will not only be injurious to the animals, but will cause irregularity in the fibre of the wool, which will seriously injure it for manufacturing purposes. An abundant supply of pure water should be provided, and protection should be given from storms and extremes of temperature.

In very early times, S. were kept for their milk and skins. In some countries the milk is used at the present day, and is even made into cheese; but the wool and flesh are the principal items for which, in most regions, S. are now maintained. An incidental, though very important, advantage is found in the improvement of the land where S. are skilfully managed.

In the great number of breeds which have been formed, there are some which have very peculiar features. The Fezzan S., found in Africa, have short and curly wool, which appears like a mane on the neck; the Caraman S., in Asia and Africa, have enormous tails, heavily loaded with fat; the Fat-rumped S. of Tartary have small tails, which are often covered by masses of fat on the rump; and the Wallachian S. of Hungary have long and nearly upright, twisted horns, and soft wool covered by long hair.

The efforts often made to combine in a single breed the highest excellences in production of both wool and mutton have not been successful. The classes of S. yielding the finest wool do not give the best meat, and no distinctively mutton breed has yet been formed which supplied the most desirable kind of fleece for manufacture into the finer fabrics. Careful breeding has greatly improved S. along the line of their predominant qualities. The quantity and quality of the fleece of the wool-producing breeds have been increased and improved, the weight of the carcass and the quality of meat of the mutton breeds have undergone equally great change, and both classes are now matured at much earlier age than formerly. But the effort to combine the highest quality of wool and the best quality of flesh results in only a medium degree of excellence along either line.

In the United States, breeds of S. are usually classed, according to the character of the fleece, into fine-wooled, middle-wooled, and coarse-wooled. Of the first, the Merino is the best type. It is one of the oldest and most widely disseminated breeds of S., was known in Spain before the Christian era, and has been brought to high perfection. When small, the lambs are rather tender, but the sheep are hardy and long-lived. They are of medium size, not very prolific, mature slowly; can be kept on rather scant pastures, but amply repay generous feeding; yield large fleeces of fine and soft wool, but are not equal to some other breeds for production of mutton. By far the larger proportion of the S. in the United States have more or less Merino blood in their veins. Differences in care, food, and climate have made marked variations in the appearance of S. of this breed in different parts of the country.

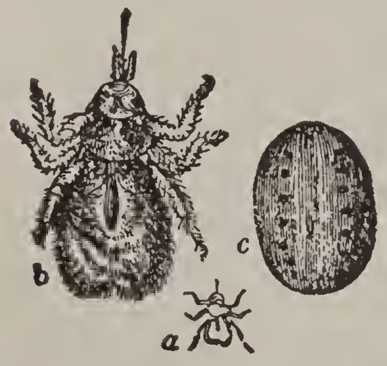
Among the middle-wooled—sometimes called the British short-wooled—breeds, one of the most popular in this country is the Southdown, an old English breed, which during the past century and a half has been greatly improved. S. of this breed mature early, are hardy and prolific, grow to good size, are nicely formed, have brown faces and legs, are excellent for mutton, and yield moderately heavy fleeces of rather fine wool. They thrive under widely differing conditions. Where only one breed can be kept to supply both mutton and wool, this is one of the most desirable, and is by many sheep-owners considered the best. There are other branches of the family, as the Shropshire, Hampshire, and Oxford Downs—valuable breeds, varying from the Southdown in only minor particulars.

One of the oldest and most popular breeds of coarse-wooled S. in England, and the most largely kept in the United States, is the Cotswold. These S. are very large, hardy, prolific, have white faces and legs, fatten readily, and yield a large quantity of long and rather coarse wool, which is in demand for combing purposes. The Leicester and Lincoln breeds, popular in England, and to some extent here, closely resemble the Cotswold.

There are many other breeds, some with only local reputation, others widely known. There is no breed of domesticated S. indigenous to this country. The very few breeds originated here have proved of little value and have been allowed to become extinct. What are known as native S. do not belong to any distinct breed, but are the result of mixtures of the blood of various imported breeds.

The S. is subject to a number of diseases. Of these, some can be easily prevented; and, with a few exceptions, the others yield to prompt and skilful treatment. (See FOOT-ROT: GRUB: ROT.) Catarrh sometimes causes heavy losses. It is due to exposure, and can be almost entirely prevented by giving the animals suitable protection. One of the most efficient remedial measures is occasional smearing of the noses of the affected animals with tar. In addition to this, a mixture of one part of sulphur to five parts of salt, placed where the S. can have constant access to it, is sometimes supplied with good effect. The Scab, a contagious and virulent disease, is caused by a minute insect which burrows in the skin, multiplies rapidly, causes intense itching, the formation of scabs, and the loss of wool, spreads from the affected centres, and, if not checked, results in death. Flocks which are properly fed, have abundance of pure water and pure air, and are protected from extremes of temperature, are not likely to contract this disease except by contagion. On its first appearance the affected animals should be isolated, and placed under treatment for destruction of the parasites. Dipping the animal in a strong decoction of tobacco is a common remedy. To this some owners add soap and sulphur, or a small quantity of blue vitriol. The application should be repeated in ten days, and in severe cases a third dipping may be required. If the disease has made much progress, the scabs should be softened, by rubbing with lard and washing with soap-suds, before the other remedy is applied. Arsenic, mercurial ointments, and various alkalies are sometimes used. Some of these are objectionable on account of their poisonous qualities, and others because of injury to the wool. There are some patent preparations said to be safe and efficient, as well as very convenient to use. Whatever course is adopted, the treatment should be careful and thorough. The interior of the pens in which affected sheep have been kept should be washed with a strong decoction of tobacco, the bedding should be burned, and the pastures which they have occupied should not be used for three months.

The Sheep-tick, known also as sheep-pest and sheep-louse, is a parasite which causes great suffering to the animals and a corresponding loss to their owners. It harbors in the wool, multiplies rapidly, and sucks the blood of the S. on which it finds its home. Infected animals are poor in flesh; their wool is injured in quality by the constant drain on the system, and is often loosened from the skin; and they cannot be made to thrive till the parasites are removed. Ticks are common on neglected S., and frequently appear on the best-kept animals. If there are lambs in the flock, the ticks leave the S. soon after they are sheared, and find refuge in the longer wool of the lambs. Dipping in a decoction of tobacco or in one of the patent preparations for the purpose will exterminate the pests. Some flock-masters dip both S. and lambs at shearing-time. Others prefer to wait till the ticks have left the S., and dip only the lambs.



Sheep-tick (*Melophagus ovinus*): *a*, natural size; *b*, magnified; *c*, the pupa, magnified.

The first domestic S. in this country were brought from England to Jamestown, Va., 1609, and about 15 years later some were brought to N. Y. and Mass. The first importation of Merino S. was 1793, when three fine animals were landed in Boston, and given to a friend of the importer who promptly converted them into mutton. In 1801 a few S. of this breed were brought from Spain and France, and the following year about 100 head were brought from Spain. Large numbers of S. of the improved English breeds have been more recently imported.

Owing to the influence of wars, to changes in the tariff affecting the price of wool, and to various other causes, the S. industry in the United States has been subject to great fluctuations. In many localities it is, and long has been, greatly depressed on account of the ravages of dogs. On the ranches of the w., where S. are kept in immense numbers, heavy losses are frequently sustained through lack of winter protection.

According to the report of the sec. of agriculture, the number of S. in the United States 1891, Jan., was 43,431,136, with average value of $2.50. Texas had the largest number, 4,990,272, followed by O. with 4,061,897; Cal. and N. Mex. each had more than 3,000,000; Mich., Or., Mont., and Ut. more than 2,000,000; and N. Y., Penn., Ind., Colo., and Wyo. over 1,000,000 each. The highest average price in any state was $4.13 in Conn., and the lowest $1.47 in Ark. By careful breeding the average weight of the fleece has been doubled during the past 30 years (see Wool). There has been marked improvement also in the quality of flesh, and great gain in early maturity.

SHEEPS'HEAD (*Sargus ovis*, now named *Archosargus probatocephalus*): fish of family *Sparidæ*, plentiful in the latter part of summer on parts of the North Amer. coast, and highly esteemed for the table. It sometimes attains a weight of 14 or 15 lbs. Nets are used, and many fish are often taken at a single haul, which are immediately packed in ice for the market. It is difficult to take the S. with a line, as its cutting teeth snap the line asunder. The genus *Sargus* has cutting front teeth, and round teeth in the back of the mouth. *S. Rondeletii* inhabits the Mediterranean, and has been esteemed for the table from ancient times. The *Sargi* feed on shell-fish and the smaller crustaceans, which they easily crush with their round teeth; partly also on sea-weeds.

SHEEPS'HEAD BAY: post village in Kings co., N. Y.; on the Atlantic Ocean, 2 m. n.e. of Coney Island. It has a church, and many summer hotels, boarding-houses, and residences, but is best known as the locality of the racing-grounds of the Coney Island Jockey Club, laid out 1880, and largely patronized.

SHEEP'-TICK, or Sheep'-louse (*Melophagus ovinus*): insect of family *Hippoboscidæ;* not a Tick proper: see Sheep: also Tick.

SHEER, a. *shēr* [Dan. *skær*, sheer, bright, pure: Goth. *skeirs*, clear: Icel. *skærr*, bright; *skirr*, clean]: quite; pure; separate from anything else; mere; downright; unmingled, as *sheer* nonsense.

SHEER, a. *shēr* [AS. *sceran*, to shear, to divide: Dut. and Ger. *scheren*, to cut: Dan. *skœre;* Icel. *skera*, to cut (see also SHEAR)]: perpendicular; precipitous; straight up and down: N. the longitudinal curve which the line of a ship's deck or sides presents to the eye: V. among *seamen*, to deviate from the line of the proper course, as a ship when not well steered; to turn aside. SHEER'ING, imp. SHEERED, pp. *shērd.* To SHEER OFF, to turn or move aside to a distance; to steal away. To SHEER UP, to turn and approach to a ship or place in nearly a parallel direction.

SHEERAZ': see SHIRAZ.

SHEERNESS, *shēr-nĕs':* seaport and naval arsenal in the county of Kent, England; on the n.w. extremity of the Isle of Sheppey, at the confluence of the Thames and Medway, 11 m. e.n.e. of Chatham. It consists of four divisions, Blue-Town, Mile-Town, Marine-Town, and Westminster; of these the first is within the limits of the garrison. The dockyard is one of the finest in Europe: it covers 60 acres, comprising wet and dry docks, immense storehouses, and official residences. The harbor is usually crowded with vessels. An extensive oyster-fishery is in the vicinity, from which as many as 50,000 bushels of 'natives' have been sent to London in one season. At Garrison Point is the residence of the port-admiral, the telegraph, coast-guard station, and barracks. The chief trade is in supplying the requirements of the employees in the various govt. establishments, and in export of corn, seeds, and oysters. The neighborhood was once thought very unhealthful, but important sanitary works have been carried out, and there are now few towns which show a better health record. The town is much visited during the summer for the excellent sea-bathing. The beach and cliffs are a favorite resort for ramblers. S. was captured by the Dutch under De Ruyter 1667, and here the mutiny of the Nore burst forth 1798. Pop. (1881) 13,941; (1901) 14,000.

SHEERS, or SHEARS, n. plu. *shērz* [see SHEAR]: in *ships*, two or more masts or pieces of timber having their lower ends secured to the sides of the vessel, and their upper or vertical ends, which slope to each other, fastened together and fitted at the joint with a pulley—used for hoisting heavy weights, as masts. SHEER-HULK, an old ship fitted with sheers.

SHEET, n. *shēt* [AS. *sceat*, a projecting corner—from *sceotan*, to shoot: Icel. *skaut*, the lap, the corner of a sail: Gael. *sgòd*, corner of a garment, or of a sail: Dut. *schoot*, a shoot, sheet]: any open piece of cloth not made up into a shaped garment; a broad large piece of anything made thin, as paper, linen, iron, etc.; in *bedclothes*, a large piece of linen or cotton cloth placed next the body; any thin covering, as a *sheet* of ice; any flat expanse, as of water; a book or pamphlet; among *seamen*, a rope attached to one or both the lower corners of a sail in order to extend it and tighten it to the wind: V. to furnish with sheets; to cover as with sheets. SHEET'ING, imp.: N. linen or cotton cloth for bedsheets; also, coarse hempen cloth used for making

Tarpaulins (q.v.,. SHEETED, pp. *shēt'ĕd*, covered with a sheet; extended in form like a sheet. SHEETS, n. plu. a book, or the pages of a book; wagon-covers of oiled canvas. SHEET-ANCHOR [corrupted from *shoot-anchor*—that is, the anchor *shot out* for security or preservation]: the largest anchor of a ship; hence, chief support; last refuge. SHEET-COPPER, -LEAD, -ZINC, or -IRON, any one of these metals rolled or formed into broad thin plates or sheets. SHEET-LIGHTNING, lightning which appears in wide extended flashes, not forked, and is unaccompanied by thunder. SHEET-PILE, a pile of thick planks. IN SHEETS. lying flat or expanded; folded, but not bound—said of the printed pages of a book. TO SHEET HOME, to extend the sail till the clew is close to the sheet-block. *Note.*—For sizes of folded sheets of paper, see under PAPER.

SHEFFIELD, *shĕf'fēld:* city in Colbert co., Ala.; on the Memphis and Charleston, the Louisville and Nashville, the Birmingham Sheffield and Tennessee River, and 7 other railroads surveyed or building 1891; 2 m. n. of Tuscumbia, the co. seat. It is one of the youngest of the new industrial cities in the south; is in a region remarkably rich in brown hematite iron ore, oolitic limestone, and cellular coke; has 5 iron furnaces, shops of two railroads, and 40 manufacturing and commercial associations with $9,255,000 combined capital; and contains churches, graded schools, 1 state bank (cap. $100,000), and 2 weekly newspapers and a monthly magazine. Pop. (1900) 3,333.

SHEFFIELD: post village and tp. in Berkshire co., Mass.; on the Housatonic river and the Housatonic railroad; 31 m. s. of Pittsfield, 45 m. w. of Springfield. The village contains Congl., Meth. Episc., and Prot. Episc. churches; an acad., grist and saw mills; and noted white marble quarries, from which was taken the stone for Girard College, Philadelphia, and the co. court-house, New York. S. is charmingly situated, and popular as a summer resort. Its attractions include the Dome, or Mt. Everett, Sagis Ravine, Bash bish Falls, Twin Lakes, and the Berkshire soda springs. Pop. (1880) 2,204; (1900) 1,804.

SHEFFIELD, *shĕf'fēld:* important manufacturing town and parliamentary borough, in the West Riding of Yorkshire, England; cap. of an independent district, called Hallamshire (see SHIRE); picturesquely situated on several hills that slope toward the confluence of the rivers Sheaf and Don, 140 m. n.n.w. of London, with which it is connected by the Great Northern and Midland railways; 43 m. s.s.w. of York. The town, generally, is well built. It possesses many fine public buildings, such as the original parish church, supposed to have been erected in the reign of Henry I., 240 ft. long by 130 ft. broad; St. Mary's Rom. Cath. Church, surmounted by a tower 200 ft. high; the town-hall, cutlers' hall, corn exchange; the new market-hall, or Norfolk Market, with roof of glass and iron, erected by the Duke of Norfolk at a cost of about £40,000; music-hall, assembly rooms, theatres, etc. There are extensive botanic gardens, and a fine cemetery about a mile from the town; many churches; numerous educational establishments, such as the Free Grammar School, the Collegiate School, the Wesley College, a Lancasterian and many national schools, free writing-schools, school of art, besides the Mark Firth College, opened 1879. The Mechanics Institution dates from 1832. There are free and other public libraries, an Athenæum, and a Literary Soc. The charitable institutions comprise an infirmary and several hospitals. As far back as the time of Chaucer S. was noted for manufacture of cutlery; and at the present day, an endless variety of articles in brass, iron, and steel is produced here; e.g., knives of every sort, silver and plated articles, Britannia-metal goods, coach-springs, spades, spindles, hammers, files, saws, boilers, stoves, grates, buttons, etc. 1864, Mar., a new embankment, constructed for the Sheffield Water Company, at Bradfield gave way, and let out a body of water 95 ft. high from a reservoir 78 acres in extent. The destruction of life and property by this flood was unprecedented in England: 250 persons perished; mills, houses, and hamlets were swept from their foundations; and, apart from the ruin of the Bradfield Dam, damage was done to private property to the extent of nearly £300,000. In 1866, trade outrages, in the form of 'rattening,' long a discredit to S., were ended (see TRADE UNION). Since 1871, the introduction of the manufacture of armorplates, railway-springs, tires, and rails has given remarkable growth to the town. The Albert Hall, erected 1873, seats 3,000 people. A street improvement scheme, begun 1875, has been carried out at a cost of more than half a million pounds. S. has several public parks (one presented 1878), and two sets of public baths. John Ruskin has founded a museum there, where he has deposited his library and an important collection of plates. Mappin bequeathed to the town pictures to the value of £100,000. In 1884, the ratable value of S. was £985,000. The borough returns five members to parliament. Mary, Queen of Scots, was imprisoned in Sheffield Manor-house, about two m. from the town, for 12 or 14 years.—Pop. (1871) 239,946; (1881) 284,403; (1891) 324,243; (1901) 380,717.

SHEFFIELD, JOSEPH EARLE: 1793, June 19—1882, Feb. 16; b. Southport, Conn. For many years he was in the cotton trade in the South. In 1835 he returned to Conn., was interested in building the New Haven and Northampton canal, and the New York and New Haven and the Chicago and Rock Island railroads. In 1860 he made large gifts to the scientific dept. of Yale Univ., which was reorganized under the name of Sheffield Scientific School. His old home in New Haven has lately been fitted up as the Sheffield Biological Laboratory of Yale. His benefactions to religious and educational institutions were more than $1,000,000. He died at New Haven.

SHEFFIELD SCIENTIFIC SCHOOL: see YALE UNIVERSITY.

SHEIK, or **Sheikh**, n. *shēk* or *shāk* [Ar. *sheikh*, a venerable old man, a chief]: in *Arabia*, the chief or Lord of a tribe or clan; among *Mohammedans*, a title of persons, learned men, or reputed saints, who preach in the mosques. This title of reverence is used also as an ordinary title of respect, like Mr., Herr, etc., before the name; but only for a Moslem. The Sheikh Al-Islam is the chief Mufti (q.v.) of Mohammedanism at Constantinople: a title supposed to have been first assumed by Mohammed II. at his conquest of Constantinople 1453, when this place became the seat of his empire. The Sheikh of Mecca, by virtue of his supposed descent from the prophet, levies a kind of tribute on all the pilgrims to the Kaaba. The term is applied also to heads of Mohammedan monasteries (our abbot or prior) and to the higher order of religious preachers. Sheikh Al-Gebal (Ancient of the Mountain) is the name of the prince of the Assassins (q.v.), or those Ismaelites of Irak, who undertook to assassinate all those whom their chief would pronounce to be his enemies.

SHEKEL, n. *shĕk'l* [Heb.—from *shakal*, to weigh: F. *sicle;* Ger. *seckel*]: originally a certain standard weight in use in Babylonia, and later among the ancient Hebrews. by which the value of metals, metal vessels, etc., was fixed. At first it equalled one sixtieth of a mina. The Phœnicians adopted it and variously modified it. Gradually the Hebrew S. became a normal piece of money, both in gold and silver, marked in some way or other as a coin, though not stamped. The gifts to the sanctuary, the fines, the taxes, the prices of merchandise, all are reckoned in the Old Test. by the shekel, not counted but weighed. Three different kinds of gold, silver, and copper shekels are mentioned: the common S., the S. of the sanctuary (probably of double value), and the S. of royal weight. Besides these, there was a half-S. (*beka*), and a fourth-S. The sacred S. was equal to 20 geras (beans), and 3.000 sacred shekels made a talent. The gold S. is reckoned approximatively to contain 161 Troy grains, the silver shekel 275. During the Babylonian exile, the Persian money (*dariks*) was used by the captive Hebrews; nor do they seem to have afterward used any but the coin of their foreign rulers. It was under the Maccabeans that national money began to be struck, adorned with sacred emblems, and with inscriptions in the native language and characters. De Saulcy alone assumes, without much show of reason, Jewish coins to have existed from the time of Alexander the Great. Simon, the 'prince and high-priest,' received according to I. Macc. xv. 16, the permission from Antiochus VII. to strike coin B.C. 138. The emblems are sacred branches, sheaves, flowers, vases, etc., and the legend (in a peculiarly archaic ['Samaritan'] alphabet) contains the date, the name of the Jewish ruler, and the inscriptions 'Shekel of Israel,' 'Jerusalem the Holy,' 'Redemption of Israel.' The latest coins with Hebrew inscriptions date from the revolution of Bar Cochba under Hadrian. The value of the silver S. is reckoned about 60 cents.

SHEKI'NAH: see SHECHINAH.

SHELBURNE, *shĕl'bėrn,* WILLIAM PETTY, Earl of: 1737, May—1805, May; son of the first earl, and descendant of Sir W. Petty. When G. Grenville succeeded Bute 1763, S., whose talents had made him remarked, though at the age of only 26, was placed at the head of the Board of Trade. When Chatham formed his second administration 1766, he made S. one of the secretaries of state, though not yet 30. At the fall of Lord North's ministry 1782, George III. sent for S., and proposed to him to form a govt.: he declined, not being the head of a party, and was sent by the king to the Marquis of Rockingham with an offer of the treasury, himself to be one of the secretaries of state. According to Earl Russell, in his *Life of C. J. Fox,* it soon appeared that S. was not so much the colleague as the rival of Lord Rockingham, the chosen minister of the court, and the head of a separate party in the cabinet. At the death of Rockingham 1782, the king sent at once for S., and offered him the treasury, which he accepted without consulting his colleagues. Fox thereupon resigned, and S. introduced William Pitt, then only 23 years old, into office as his chancellor of the exchequer. S.'s ministry, on the occasion of the king's announcement of his determination to concede the independence of the American colonies, found itself outvoted by the coalition between Fox and Lord North. He resigned, and the coalition ministry took his place, but soon broke up. The nation expected that the king on this event would have sent for S., but William Pitt received the splendid prize, and S. was consoled by the coronet of a marquis (of Lansdowne). During the later years of his life, his health was delicate, and he withdrew from public life; but he came forward as a strong supporter of the union with Ireland. He indulged his tastes in the adornment of Lansdowne House. Here he collected a splendid gallery of ancient and modern pictures, with a library of 10,000 vols., comprising the largest collection of pamphlets and memoirs on English history and politics possessed by any man of his time, as well as a series of MSS., which were sold to the Brit. Museum for £5,000. He was a discerning patron of genius. It was while Priestley resided in Lansdowne House as the librarian and friend of S. that he made the discovery of oxygen. Jeremy Bentham was one of S.'s intimate friends. S. was patron and friend of Sir S. Romilly, and twice offered him a seat in parliament. He was also on terms of intimacy with Mirabeau, Dumont, and other foreigners of literary and political distinction. See *Life of S.,* by Lord Edmond Fitzmaurice (London 1875–6).

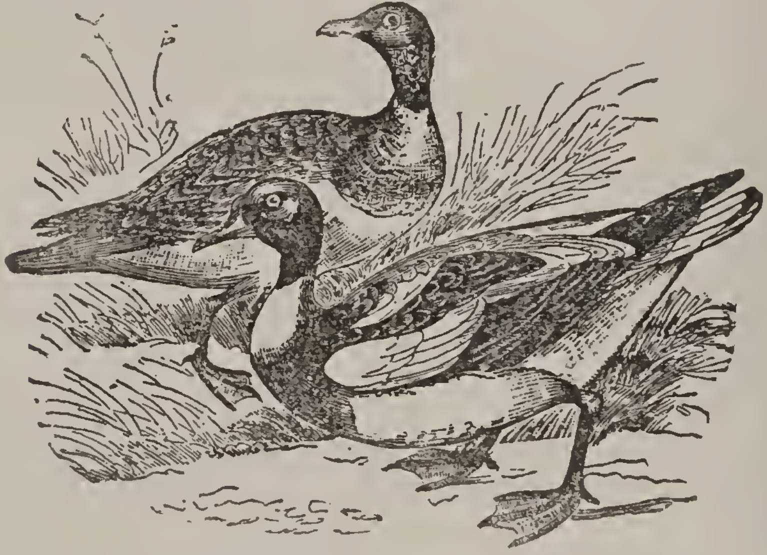
SHELBY, *shĕl'bĭ,* ISAAC: soldier. 1750, Dec. 11—1826, July 18; b. North Mountain, Md.; son of Gen. Evan S. The family removed west, and he began his military career as lieut. in his father's company in the battle of Point Pleasant. He entered the revolutionary army; was made capt. and given charge of the Va. commissary dept. 1777; promoted col., 1780. With Col. John Sevier he planned the battle of King's Mountain, for which they received the thanks of the N. C. legislature. Col. S. suggested the expedition which led to the victory at Cowpens, and did good service in S. C. He was a member of the gen. assembly, and first gov. of Ky. 1792. During the second war with England he was again gov. 1812–16, and at the head of a force of 4,000 vols. which he had organized gave Gen. Harrison valuable aid. In 1817 he refused the post of sec. of war under Pres. Monroe.

SHELBYVILLE, *shĕl'bĭ-vĭl:* city, cap. of Shelby co., Ind.; on the Big Blue river, and on the Cleveland Cincinnati Chicago and St. Louis and the Pittsburgh Cincinnati Chicago and St. Louis railroads; 27 m. s.e. of Indianapolis. It is in a farming region; is beautifully laid out and ornamented: has several co. buildings, opera-house, 7 churches, public schools, gas and electric light plants, 2 national banks (cap. $200,000), 1 private bank, and 3 daily and 2 weekly newspapers; and has a growing trade in grain and livestock and several industrial works. Pop. (1880) 3,745; (1890) 5,451; (1900) 3,546.

SHELDAPPLE, n. *shĕld'ăp-pl,* or SHELD'AFFLE, *-ăf'l* [OE. *sheld*, spotted, party-colored: Icel. *skiöldr*, a shield: Dan. *skioldet*, party-colored: Norw. *skioldet*, spotted: *sheldapple* probably stands for *sheld-dapple*]: a bird, the chaffinch. SHEL'DUCK, the hen or female Sheldrake (q.v.).

SHELDON, *shĕl'don,* GILBERT, D.D.: 1598, July 19—1677, Nov. 9; b. Staunton, Oxfordshire, England. He graduated at Trinity Coll., Oxford, took orders, and 1635 became warden of All Saints and chaplain to Charles I. He suffered imprisonment for devotion to the royal cause, and lived in retirement several years. Under Charles II. he became bp. 1660; abp. of Canterbury 1663; and chancellor of Oxford Univ. 1667. He made large gifts for charitable purposes, and built the Sheldonian Theatre for Oxford, designed by Sir Christopher Wren and costing £16,000.

SHELDRAKE, or **Shelldrake**, *shĕl′drāk* (*Tadorna* and *Casarka*): genera of ducks of the section having the hind-toe without any pendent membrane. The sheldrakes are a connecting link between geese and ducks, having much resemblance to the former. The species are mostly natives of the s. hemisphere; but the Common S. (*T. vulpanser*, or *Bellonii*) is common on the sandy sea-shores of Britain; many coming from the n. for the winter, and some remaining all the year, and breeding, making their nests in rabbit-burrows or other holes in soft soil, whence in some places the S. receives the name *Burrow Duck.* It is a beautiful bird, the sexes nearly alike in plumage; the head and upper part of the neck green, with a collar of white, and a lower collar of rich chestnut, extending over part of the back, the rest of the back white. The whole length is fully two ft. The S. is very capable of being tamed, and breeds in domestication. Its note is a shrill whistle. Its flesh is coarse and unpalatable.—The Ruddy S (*T. rutila*), the only other European species, is common in many parts of Europe and Asia.—In the United States the name S. is improperly given to the Red-breasted Merganser, from some resemblance of color.



Sheldrake, Female and Male (*Tadorna vulpanser*)

SHELF, n. *shĕlf*, **Shelves**, n. plu. *shĕlvz* [AS. *scylfe*, a board, a shelf: Dut *schelf*, the scaffold on which a mason stands: Low Ger *schelfen*, to raise on a scaffold or boarding: Scot. *skelve*, to separate in laminæ]: a flat board fixed horizontally against a wall on which articles may be laid or stored; a shoal or sand-bank in the sea; a ledge of rocks; a flat projecting rock. Shelf′y, a. -*ĭ*, full of shelves or hidden rocks. Shelve, v. *shĕlv*, to place on a shelf; to put aside or out of use or notice, principally used with respect to persons; to be sloping. Shelv′ing, imp.: Adj sloping: N materials for shelves. Shelved. pp. *shĕlvd.* Shelvy, a. *shĕlv′ĭ*, full of shelves or dangerous shoals. Shelv′iness, n. -*ĭ-nĕs*, the state of being shelvy. Laid on the shelf, or Shelved, laid aside from active professional work; laid aside from any position or expectation; said of any measure or question set aside or allowed to drop.

SHELL, n. *shĕl* [Dut. *schel*, shell: Ger. *schale*, a shell, bark of a tree: same as *scale* and *shale*]: the hard or stony covering of some fruits and seeds, and of certain animals, as crabs; a pod or seed-case; the stony covering of a mollusk, as the mussel, the oyster, etc. (see below): the hard outer coat or covering of anything, as of an egg; the superficial part; a husk; outward show; a house partly built: in *mil.*, a hollow shot filled with an explosive and destructive compound (see below): a rough coffin: V. to strip or break off the shell; to be freed from the husk; in *mil.*, to fire shells at. SHELL'ING, imp.: N. groats, in commercial language. SHELLED, pp. *shĕld:* ADJ. separated from the shell; under fire of shells. SHELL-LESS, a. without shells, applied to certain mollusks. SHELLY, a. *shĕl'ĭ*, abounding with shells; consisting of shells. SHELLBARK, a species of hickory, or its bark. SHELL-CAMEO, an imitation of the antique cameo cut on a shell instead of a stone. SHELL-FISH, a water-animal incased with a hard and stony covering, as the mussel, the oyster, etc. SHELL-JACKET, an undress military jacket. SHELL-LIME, lime made by burning the shells of shell-fish. SHELL-MARL, in *geol.*, a deposit of clay and other substances mixed with shell-remains, found valuable as a manure. SHELL-MOUNDS, the mounds found in many places on the shores of northern Europe, and composed largely of the shells of the oyster, the cockle, the mussel, and other edible mollusca—remains of anc. feasts (see KITCHEN-MIDDENS). SHELL OUT, *familiarly*, bring out your money. SHELL-PROOF, in *mil.*, parts of a fortified place rendered capable of resisting the explosive and destructive power of shells. SHELL-SAND, on certain coasts, the sands composed in great measure of broken and worn shells, and often containing a small proportion of organic matter. It is a very useful manure, particularly for clay soils, heavy loams, and newly-reclaimed bogs. It is also advantageously applied to any soil deficient in lime. It neutralizes the organic acids which abound in peat, and forms with them compounds which serve as food for plants. Shell-sand is much used as manure in some maritime districts of Britain, and of France, as Bretagne and Normandy. SHELL-WORK, ornamental work composed of shells, or adorned with them. BLIND-SHELLS, shells which contain no bursting charge. INCENDIARY SHELLS, shells filled with a highly combustible composition, employed for setting fire to distant buildings, etc. SEGMENT SHELL, a shell built up of iron segments inclosed in a thin iron covering.

SHELL: hard outer covering of a large number of invertebrate animals. Shells are found in the *Echinodermata*, in the great majority of the *Mollusca* (excluding the Molluscoids), in a few of the *Annelida*, as Serpula, Spirorbis, etc., in the *Cirropoda*, and in the *Crustacea;* also in some *Protozoa*, among the lowest of animals; and, among the highest, certain fish, such as the trunk-fish and hippocampus; turtles in the class *Reptilia*, and armadillos in the class *Mammalia*—in the higher animals the shell being hardened integument, the turtles with the addition of expanded rib-plates. For forms of the varieties of shells, see names of the classes of animals to which they respectively belong. The intimate structure of shell was formerly misunderstood: the doctrine was, that shell is not only extravascular (or devoid of vessels), but completely inorganic, being composed of an exudation of calcareous particles (chiefly carbonate of lime) cemented together by a kind of animal glue. It is now known that shell always possesses a more or less distinct organic structure, which in some cases resembles that of the *epidermis* of the higher animals, while in others it approximates to that of the *derma*, or true skin. The nature of the organic structure is so different in the Echinodermata, Mollusca, and Crustacea, that a separate description is required for each, and, as Dr. Carpenter remarks: 'Even in the subordinate divisions of these groups, very characteristic diversities are frequently observable, so that, as in the case of the teeth, it is often possible to determine the family, sometimes the genus, and occasionally even the species, from the inspection of a minute fragment of a shell, as well fossil as recent.'

In the *Echinodermata*, the elementary structure of the skeleton shows a network of calcareous and animal matter

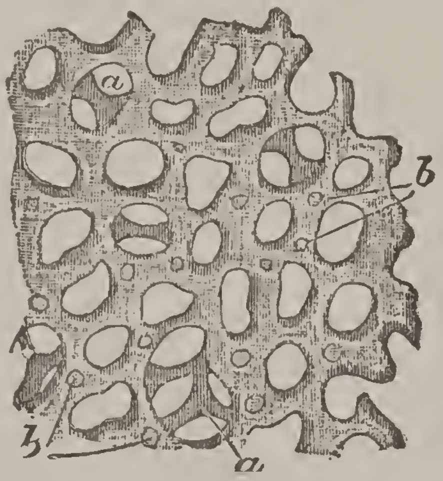


Fig. 1.—Thin Lamina of Shell of Echinus, showing its Areolar Structure:
a, *a*, portions of subjacent layer; *b*, *b*, fractured bases of columns connecting the superposed laminæ. Magnified 164 diameters.

intimately united. The diameter of these apertures or meshes of network varies to a certain degree in different parts of the same shell, the openings being larger in the inner than the outer layers, the extremes being $\frac{1}{450}$ and $\frac{1}{1250}$ of an inch. The entire shell is made up of an immense number of such plates, parallel to one another, separated by minute vertical pillars.

In the *Mollusca*, the shell is formed upon the surface of the mantle, which corresponds to the true skin of other animals: hence it must be regarded as epidermic. It consists of cells consolidated by a deposit of calcareous salts in their interior; but, as in the case of many other tissues, the original cellular organization often becomes so hidden by subsequent changes as to cease to be recognizable. The typical condition of the shell in this sub-kingdom is seen best in certain bivalves—the genus *Pinna*, for example. On breaking off a small portion of the projecting margin of one of these shells, and examining it under the microscope, it is found to be made up of a vast number of prisms, hexagonal in form, and nearly uniform in size, arranged perpendicular to the surface of the lamina of the shell, so that the thickness of the lamina is formed by their length, and its surfaces by their extremities. On submitting such a lamina to the action of a dilute acid, the calcareous salts are dissolved, and a membrane is left which shows the prismatic structure as perfectly as it was seen in the original shell, the hexagonal divisions being evidently the walls of cells resembling those occurring in the pith or bark of a plant. It happens sometimes in recent, but more often in fossil shells, that the animal matter decays and leaves the prisms ununited and easily separable from one another. It is only in a few families of bivalves that the cellular structure is seen in this very distinct form, or that it makes up a large portion of the shell; and these families are closely allied to *Pinna*. In many shells the external layer is formed on the above plan, while the internal layer is nacreous; in many others the nacre, or 'mother-of-pearl,' and in others sub-nacreous structure, constitutes nearly the whole thickness of the shell. The nacre, according to Sir D. Brewster, consists of a multitude of layers of carbonate of lime, alternating with animal membrane; and the grooved lines on which iridescent lustre depends are due to the wearing away of the edges of the animal laminæ, while those composed of carbonate of lime stand out; it is, however, more probable, from Dr. Carpenter's researches, that the peculiar lineation of the surface of nacre is due to the disposition of a single

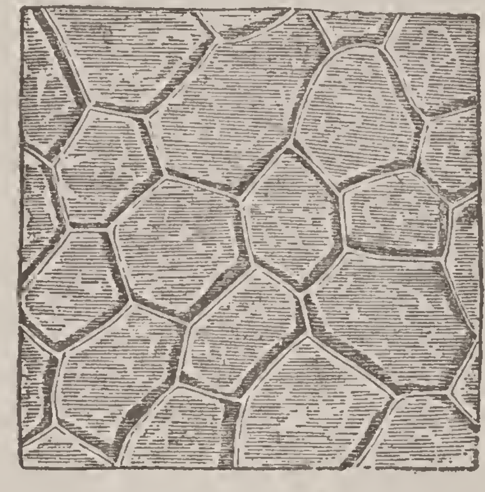


Fig. 2.—Section of the Shell of Pinna parallel to the Surface, showing Prismatic Cellular Structure, cut transversely, magnified 185 diameters.

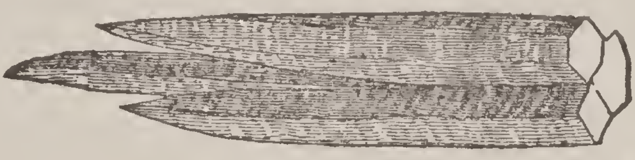


Fig. 3.—Calcareous Prisms of the Shell of Pinna, from Chalk.

membranous layer in folds or plaits which lie more or less obliquely to the general surface.

In the *Crustacea,* the structure of the shell has been examined only in the order of Decapods. In this order—in the common crab, e.g.—the shell consists of three layers:

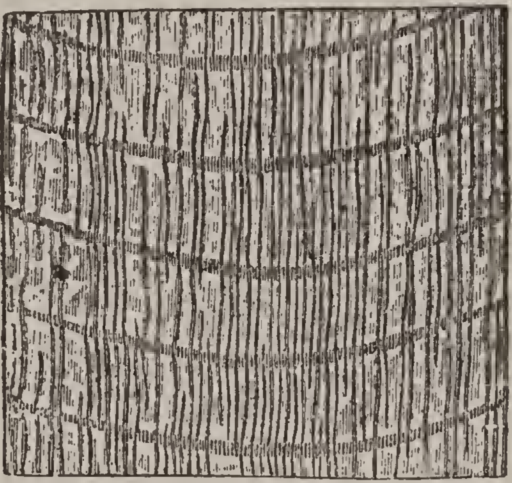


Fig. 4.—Portion of Transverse Section from Claw of Crab, magnified 400 diameters.

(1) an external horny epidermic membrane covering the exterior; (2) a cellular or pigmentary structure; (3) an internal calcareous or tubular substance. The horny layer is easily detached after the shell has been for some time immersed in dilute acid; it is thin and tenacious, with no sign of structure. The pigmentary layer is very thin in the crab and lobster, but is much thicker in some other Decapods. The internal layer constitutes the chief part of the shell; in this layer chiefly the calcareous matter is deposited; but even after this has been removed, a distinct animal basis remains, which closely resembles that which is left after the dentine of the teeth has been deprived of its inorganic constituents, as may be seen in the accompanying figure, representing a transverse section from the claw of the crab; the dark lines representing minute tubules.

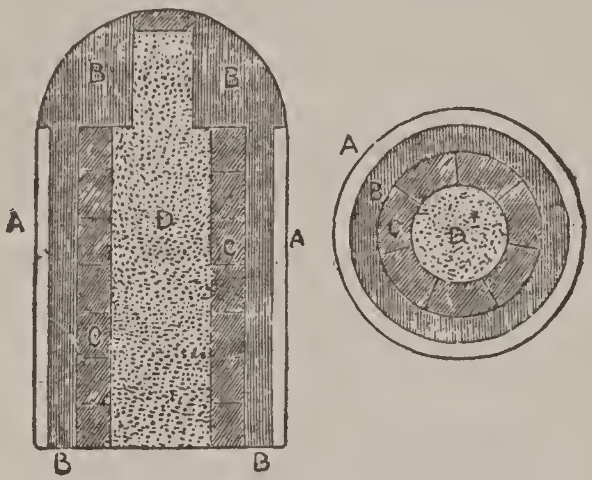
See further, Dr. Carpenter's various articles on the Microscopic Structure of Shells, especially 'Shell' in *Cyclopædia of Anatomy and Physiology* (from which materials for the present article have been drawn), and his *Microscope and its Revelations.*

The usual forms of S. among Mollusca (q.v.) are the spiral univalve; the doubly-convex bivalve; and the boat-shape, or else coiled and chambered structures of nautili. But the forms in the past and present are infinitely varied. In the Haliotis (q.v.) a really spiral univalve presents only the appearance of half a bivalve; in Limpets (q.v.) a simple open cone; in Dentalium (q.v.) the S. is prolonged into an uncoiled tube; in Chitons (q.v.) it is broken up into 8 transverse imbricated plates. On the other hand, the bivalves exhibit some equally remarkable disguises. The fossil Hippurites (q.v.) and Radiolites resemble horns, one valve serving as a lid on the large end; in Diceras (q.v.) and other species the valves assume the shape of two horns; in Solen the valves become extremely elongated; in Aspergillum (q.v.) a tube with perforated nozzle obscures the small valves, and these are concealed also in the rock or wood-boring species and in Vermetes, all having cases like some sea-worms, so that Teredo (q.v.) is even called mistakenly the 'ship-worm.' In the Cephalopoda (q v.) the shell is in many species internal, even when a gasteropod-like coil as in Spirula; and in fossil species of nautili and ammonites every possible eccentricity of form occurs, one (Turrulites) even mimicking spiral gastèropods like Turritella, and other turreted genera. The exhaustless variety of sculpture, spines, etc., in Mollusca, and the beautiful coloring (not explainable by natural selection), are well known.

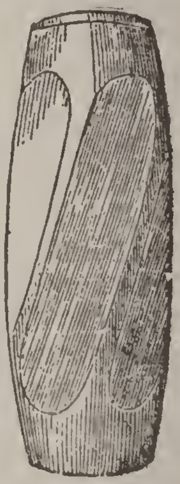
SHELL, in Gunnery (anc. *Bomb*): hollow vessel of metal, containing gunpowder or other explosive compound, so arranged that it shall explode at a certain point, and spread destruction around by the forcible dispersion of its fragments. The invention of this murderous missile cannot be accurately traced. Shells were employed 1480 by the sultan of Gujerat, and by the Turks at the siege of Rhodes 1522. The Spaniards and Dutch both used them during the war of Dutch independence; and they appear to have been in general use about 1634. As shells required Mortars (q.v.) for their projection, they were not used in naval warfare until the French constructed special bomb-vessels 1681; but since that period, shell-guns, being cannon of large bore, have been introduced, and shells are now employed by all ships of war.

Until comparatively recent years, every shell was a hollow sphere of cast iron, varying in thickness from half an inch to two inches, and in diameter from five and a half inches to thirteen inches. The sphere had a fuse hole (like a bung-hole) an inch across, through which the charge was inserted, consisting of pieces of metal and powder to burst the shell. The hole was plugged by a fuse, which was a tube of slow-burning powder, timed to communicate fire to the charge after the lapse of a certain number of seconds. This fuse might either be kindled by hand the moment before the mortar was fired, or its ignition might be effected by the act of firing the mortar. The *Shrapnel* shell, introduced by Col. Shrapnel of the Brit royal artillery about 1808, contained a number of bullets; and being fired at bodies of men, it was timed to explode about 100 yards before reaching them, when the shell burst, and the bullets with the fragments continued their course, diverging continually as they went, until they reached their object in a death-cloud. The *Concussion shell*, or *Percussion shell*, is one in which the charge is fired by the detonation of a cap on striking an object. If sufficiently delicate to explode on touching a soft object, and at the same time not to be exploded by the resistance of the air to its rapid flight this form of shell is the most certain in execution

Since the introduction of rifled ordnance the shell has become the commonest form of projectile. It has ceased to be spherical, and is usually in the shape of an elongated bolt. The *Armstrong* shell is a pointed bolt of iron (usually percussion), containing an inner 'segment shell,' made up of 49 segments of cast iron. Seven of these segments form a circle, or ring, and seven circles give the necessary length. A coating of lead affords a soft medium for fitting into the grooves of the gun. The shell thus made somewhat resembles a bottle without the neck. The necessary bursting charge having been inserted, the rear-end is plugged with lead, the fuse is screwed into the front, and the shell is ready for action. This projectile has a great and accurate range, and its segments cannot fail, on explosion, to do great damage. The principal drawback has been found in the lead casing, which is often thrown off in parts soon after the shell leaves the gun, and which thus falls among the foremost ranks of the army using it, sometimes inflicting severe wounds. The *Whitworth* shell is an elongated hexagonal bolt of iron or steel, cast in one piece, and with a bursting charge at the rear-end. It explodes on percussion; but the space allowed for the burster is deemed insufficient to produce the full effect which the length and correctness of the weapon's range give cause to expect. The *Lancaster* shell is oval, to fit the bore of the *Lancaster* Gun (q.v.). *Martin's* shell is charged with molten iron, which sets on fire all combustible matter on which it can be thrown. The *Diaphragm* shell, invented by Col. Boxer, of the Brit. army, has an iron division or diaphragm to separate the powder in the shell from any balls or slugs, in order that the friction of the latter may not prematurely cause the powder to explode. A six-pounder diaphragm shell contains 30 carbine-balls; an eight-inch shell 322 musket-balls. The *Palliser* shell, which is now employed in the British service, is remarkable chiefly for the hardness imparted to its fire-point by a process of 'chilling' during casting. This gives it a great power of penetration into iron plates, etc.



Armstrong Shell:
A, lead casing; B, outer shell; C, segments; D, charge.



Whitworth Shell.

These are typical of the British service. In America, inventors, James and Read among the earliest, have given much attention to hollow projectiles. In 1856 Read produced a shell with a wrought-iron cup or washer imbedded in a groove in the shell. This would tend to expand and take the rifling of the gun, and prevent windage. Recognizing the weakness of lead as a jacket, Hubbel, in 1860, reinforced the same by including in it a wire coil. In 1861 Parrott introduced a shell with a brass or iron cup at the base, which under pressure of the exploding charge was forced into the grooves. The cup was swaged with projectiles so as to fit the grooves of the bore as nearly as possible. Hotchkiss 1862 surrounded the rear-end of his shell with a soft metal ring, expanded in firing by an annular wedge or species of *sabot,* which wedge-like segment formed a third section of the shell. The same inventor 1865 modified this missile by introducing a packing of elastic material to modify the action of the annular wedge. In 1861 Dahlgren placed projections upon the shell to fit the rifling, and also gave it a soft metal sabot to prevent windage.

As regards the use of high explosives for bursting charges various attempts (Shaffner 1866, and within a few years Lieut. Graydon and others) have been made to utilize these by protecting them from shock. The explosive is subdivided and packed in elastic material to prevent the blow of the powder, or friction and concussion with the sides of the barrel, from exploding it in the gun. Such accident has already happened several times.

The *Zalinski* shell used with the Pneumatic Dynamite Gun (q.v.) is of a distinct order, and is really an aerial torpedo. It is of thin metal, with a fuse arranged to work by time, on percussion, or on immersion in water. The explosive and fuse are carried in the shell proper, while a tail of wood or metal is attached to the rear-end to keep it from losing its alignment or 'balloting.' Great accuracy has been attained with it on known ranges.

The present effort is to secure penetration; and armor-piercing shells of steel, of special brand and specially treated, are a subject of trial and experiment (1891). The introduction of improved armor-plate has made the problem more difficult of solution.

SHELLAC, or SHELL-LAC, n. *shĕl'lăk* [Ger. *schell-lack—lack,* varnish (see LAC 1)]: crude lac-resin formed into thin cakes after being melted and strained (see LAC).

SHELLEY, *shĕl'ĭ*, PERCY BYSSHE: 1792, Aug. 4—1822, July; b. Field Place, near Horsham, Sussex, England; eldest son of Timothy S. (afterward Sir Timothy S., Bart.), representative of an old Sussex family. His earlier education he received at home with his sisters. About the age of ten, he was sent to a school near Brentford, and three years later transferred to Eton. Shy and sensitive, yet self-willed and unsubmissive, he suffered from the harsh discipline of masters and the tyranny of his ruder associates. In his refusal to fag at Eton, he gave early indication of that passionate impatience of every form of compulsion not approving itself to his reason which through life distinguished him and found expression in his writings. 1810, Apr., he entered University College, Oxford. Even thus early, he had become an advanced free-thinker; and a pamphlet, *The Necessity of Atheism,* which he circulated—and was supposed to have written—during the second year of his college course, led to his expulsion from Oxford. This so irritated his father, that for some time he declined to receive him; and on his runaway marriage 1811, Sep., to Harriet Westbrook, beautiful daughter of a retired innkeeper, the estrangement between them became complete, the old gentleman consenting to allow his son a liberal yearly income, but never afterward having any intercourse with him. S.'s marriage was in its issue tragical. In 1813 a separation took place between him and his wife, who, with two children, returned to the care of her father; and three years later the unhappy woman drowned herself. The refinements of intellectual sympathy which poets desire in their spouses, S. failed to find in his wife, but for a time he seems to have lived with her not unhappily; nor to the last—though some bickerings arose between them—had he any fault to allege against her, except such negative ones as might be implied in his meeting a woman whom he liked better. The preferred one was Mary Wollstonecraft Godwin (1797-1851), daughter of the celebrated William Godwin and Mary Wollstonecraft, with whom, 1814, S. travelled in France and Switzerland, and who afterward became his second wife in an unusually happy union. She was author of the remarkable novel *Frankenstein*, whose hero, a profound student of nature, discovers the secret of creating life, and produces a monster whose history, though wild and horrible, is invested with a strong human interest. On the death of S.'s first wife, he laid claim to his children, this claim their grandfather Mr. Westbrook, successfully resisted at law on the ground of S.'s atheism, as exhibited in the poem of *Queen Mab,* printed a year or two before for private circulation.

In 1815, living at Bishopsgate, near Windsor, S. wrote *Alastor*, one of the most finished and characteristic of his works; followed by *The Revolt of Islam*, composed 1817 at Marlow. In the interval, during a tour in Switzerland, he had formed the acquaintance of Lord Byron, with whom afterward in Italy he had much intimate intercourse. Shortly after his return from Switzerland with his wife, the suicides occurred—first of Fanny Wollstonecraft, Mrs.

S.'s sister; then of Harriet S., his former wife. In 1818, Mar., S. left England finally—as it proved—to proceed to Italy; and during that and the following year, chiefly while resident in Rome, he produced what may rank as his two finest poems—the grand lyrical drama of *Prometheus Unbound* and the tragedy of *The Cenci.* While at Venice with Lord Byron 1820, he wrote *Julian and Maddalo*, a record in enduring verse of an interesting conversation of the discussional kind between the noble poet and himself. His other works of chief importance are: *Rosalind and Helen*, begun before he left England; *The Witch of the Atlas*, written 1819; *Epipsychidion; Adonais* (lament on the death of Keats); and *Hellas* (lyrico-dramatic burst of exultation on the outbreak of the Greek war of liberty)—all three dating 1821. The winter of 1821 S. passed at Pisa; and in the April following he established himself near Lerici, in the Gulf of Spezia. His fondness for boating had through life amounted to a passion, and here he indulged it to the full. 1822, July 8, in the company of an ex-naval friend, Mr. Williams, he sailed from Leghorn, whither he had gone to welcome his friend Leigh Hunt to Italy, and was lost in a sudden squall on his voyage homeward. The bodies were, after some time, washed ashore, and were burned, as the quarantine law of the country required, in presence of Lord Byron, Leigh Hunt, and another intimate friend, Trelawney. S.'s ashes were carefully preserved, and lie buried in the new Protestant cemetery at Rome.

S.'s opinions, religious, social, and political, often were crude and were everywhere expressed with reckless vehemence. There was in them much that might reasonably offend. Naturally they roused against him a storm of obloquy; also they made him throughout life the mark of slanders. Chiefly to this evil repute it is to be attributed that, while he lived, his genius met no wide appreciation. It has been amply recognized since; though his philosophical principles, avowedly anti-Christian and anti-social, and his practical life, defiant of all moral standards recognized in civilized society, have neither gained nor deserved a reputable standing. As a poet, in sustained lyrical impetuosity S. surpasses every other writer of his day; his diction is not more remarkable for its opulence than for the expressive subtlety and precision with which it defines the nicest refinements of feeling and thought; and his page flashes with imagery like a royal robe rich with gems. But too often, while he dazzles, he bewilders; he is fond of supersubtle abstractions, unsubstantial as clouds or dreams; and frequently in reading him we seem merely to be looking on wreaths of rainbow-colored mist. This want of clear and firm outlines is more or less felt throughout all his larger works, except *The Cenci*, in which a terrible story of real life is dramatized with consummate vigor and directness of treatment. The rest of his poems concern themselves mostly not with the world as it is or has been, but with a perfected world which is to be. His prose is ranked by critics on an equality with his poetry. In his later works, some have found indications of a vague Pantheism.

The most complete edition of S.'s works is that by J. Buxton Forman (4 vols. Poems, 4 vols. Prose, 1880). See Trelawney's *Recollections of the Last Days of Shelley and Byron* (1858); the *Shelley Memorials*, by Lady Shelley (1859); *Shelley's Early Life*, by D. MacCarthy (1872); and Lives by T. Medwin (1847), T. J. Hogg (1858), G. Barnet Smith (1877), J. A. Symonds (1878), and J. C. Jeafferson (1885).

By common testimony of all who knew him, S. was gentle and lovable, and of large-flowing charity. He was enthusiastic, generous, fervid, courageous, with strong rejection of authority and refusal of restraint; full of a passion of philanthropy, and with a great love for the abstract good.

SHELL-GUN: term belonging to the past, as in modern rifled artillery all guns fire shells. Before their introduction, however, shells were fired from guns of large bore and proportionately small thickness of metal, not differing materially from howitzers, except that they had greater length.

SHELTA, n. *shĕl'ta:* an ancient Celtic language, said to be peculiar to tinkers, but extensively understood and spoken by most of the confirmed tramps and vagabonds in Great Britain.

SHELTER, n. *shĕl'tėr* [a corruption of OE. *sheld-trume*, a body of troops, a guard—from AS. *scild-truma*, *lit.*, a shield-troop—from *scild*, a shield; *truma*, a troop: Dan. *skjul*, cover, shelter: Icel. *skyla*, to cover, to protect]: that which covers or protects from external injury or attack; one who protects or defends; state of being covered; an asylum; a refuge; a temporary shed or hut: V. to cover or protect from injury or attack; to defend; to betake to a place of safety; to afford protection to; to hide from notice; to harbor. SHEL'TERING, imp. SHEL'TERED, pp. *-tėrd*. SHEL'TERLESS, a. *-tėr-lĕs*, without shelter or protection.—SYN. of 'shelter, n.': asylum; refuge; retreat; sanctuary; covert; security; protection; defense; guardian; protector; defender.

SHEL'TER ISLAND: island and town in Suffolk co., N. Y.; in Gardiner's Bay, near the e. extremity of Long Island; ½ m. from Greenport; 6 m. long; 8,000 acres. It has excellent fishing and bathing, fine yachting facilities, and ample hotel accommodations for a summer resort. The island was originally the home of the Manhasset Indians, was settled as a part of Conn. 1652. Pop. (1900) 1,666.

SHELTIE, n. *shĕl'tĭ* [corruption of *Shetland*]: a pony of a small breed from the Shetland or Orkney Islands; also called a SHOLT, *shōlt*.

SHELVE, SHELVY: see under SHELF.

SHEM, *shĕm:* eldest son of Noah: see SEMITIC.

SHEMAKHA, *shĕ-mâ'kâ:* former name for what is now known as the govt. of Baku, occupying the s e. portion of Transcaucasia; 14,915 sq. m. North of the Kur, and around its mouth, the surface is level, low, and fruitful, though little of the surface is under cultivation. Only the towns and seaports, and in the village in their vicinity, are agriculture and industry pursued. The mountainous regions are inhabited by a rude, predatory people. Pop. (1880) 540,800; (1889) 744,930; (1897) 789,659.

SHEMA'KHA: city, cap. of one of the six circles in the govt. of Baku, about 70 m. w.n.w. of the town of Baku. Formerly a thriving town, with silk and other manufactures, it was destroyed by an earthquake 1859. After having been rebuilt, it was again destroyed almost entirely by another earthquake 1872. Pop. (1897) 20,000.

SHEMIT'IC: see SEMITIC.

SHENANDOAH, *shĕn-ăn-dō'a:* post-borough in Schuylkill co., Penn.; on the Lehigh Valley, the Philadelphia and Reading, and the Pennsylvania railroads; 12 m. n. of Pottsville. It is in one of the richest anthracite coal regions of the state, and in busy seasons has mined and shipped more than 1,000,000 tons annually. It contains 18 churches, 1 theatre, 2 public halls, gas and electric light plants, 2 nat. banks (cap. $200,000), and 1 daily and 3 other newspapers. In 1894-5 it had 4,500 children of school age (6-21 years), of whom 2,879 were enrolled in public schools. There were 8 public school buildings, with accommodations for 3,178 pupils; 54 teachers; school property valued at $110,000; receipts $50,629, and expenditures, $56,746; pupils enrolled 1901, 3,100. Pop. (1880) 10,147; (1890) 15,944; (1900) 20,231.

SHENANDOAH, *shĕn-ăn-dō'a,* RIVER: in Va., largest tributary to the Potomac, draining the beautiful and fertile valley between the Blue Ridge and the principal range of the Alleghanies. It rises in two branches near the centre of the state, and runs n.e. to the Potomac, 170 m., being navigable for small boats 100 m. In the civil war, this valley was the scene of numerous conflicts, was successively occupied by the opposing armies, and finally laid waste by Gen. Sheridan in the autumn of 1864.

SHEND, v. *shĕnd* [AS. *scendan,* to confound, to shame: Ger. *schande,* disgrace, shame]: in *OE.,* to ruin; to spoil; to disgrace; to degrade; to reproach; to crush; to overpower. SHEND'ING, imp. SHEND'ED, or SHENT, pp. disgraced; degraded.

SHENDY, *shĕn'dē:* town of Africa, in Lower Nubia, on the right bank of the Nile, 100 m. in direct line below Khartoum. At its markets, two of which take place every week, a large variety of articles e.g., wheat, straw, salt, and cotton goods, are sold. Near the town the finest senna is obtained. In 1889 almost the entire pop. of the town and district perished by famine.

SHEN-SEE, *shĕn-sē':* province of China, s. of Mongolia; 32°—40° n. lat., 106°—111° e. long.; bounded e. by the Hoang-Ho river. It yields iron, porphyry, jasper, gold, copper, millet, musk, ginseng, and timber. Military and agricultural implements and felt for soldiers' clothing are manufactured. Its chief city is Se-Gan Foo (q.v.). Pop. of province 12,200,456.

SHENSTONE, *shĕn'stŏn*, WILLIAM: 1714–1763, Feb. 11; b. Leasowes, Hales Owen, Shropshire, England; son of Thomas S. and his wife Anne Penn. In 1732 he was sent to Pembroke College, Oxford, where he applied himself to the study of English poetry. In 1737 he published without his name a small volume of miscellaneous verse; 1741, appeared his *Judgment of Hercules;* 1742, *The Schoolmistress*, the work by which chiefly he is remembered. In 1745, his parents being dead, he established himself on his property of the Leasowes, where he busied himself with landscape gardening, and such was his success in beautifying his little estate with diversified surface and labyrinthine paths and winding waters, that it attracted visitors from all quarters, and brought him more fame than his poetry. Thus, however, he was brought into serious pecuniary embarrassments in his last years.

S. sought to lead an Arcadian life, and to write as a recluse. *The Schoolmistress*, which has secured for its author a permanent place among minor English poets, is written in the stanza and antique manner of Spenser's *Faery Queen;* and in the contrast between the stateliness of the vehicle, and the familiar and homely quality of the subject, with the graphic truth of its treatment, there is a singular charm. His other works are mostly insignificant; except his *Pastoral Ballad*, which has touches of exquisite tenderness and truth of sentiment expressed in a simple and appropriate melody.

SHEOL, n. *shē'ōl* (LXX. *Hades*, *Thanatos*, Vulg. *Inferi*) Hebrew term of very frequent occurrence (65 times) in the Old Test., and rendered by the Authorized Version: grave, hell, or pit. Its derivation is doubtful: while some connect it with a root denoting to seek, others derive it from a root 'to dig out,' 'to hollow' (compare Ger. *Hölle*). The use of the word in the original seems to prove a fluctuation of the dogma respecting the world to come, during the various periods represented in the successive special epochs represented by the Old Test. Sometimes it stands unmistakably for 'tomb,' although our notions of an artificially prepared grave do not originally belong to it; at other times, it is the abode of disembodied spirits, whether good or evil. It is the place whither the dead go to be united with their 'people,' their 'ancestors,' friends, and all the departed. It was spoken of as in the centre of the earth, or below the ocean—a dismal, dark place, like the Orcus, or Tartarus of the heathen: it has gates and bars, it has chambers, valleys, and rivers, and its inhabitants—the shadows—(*Rephaim* = feeble ones), who ordinarily enjoy deep repose in this 'reign of silence,' are troubled by being called up to the surface, or tremble at the arrival among them of some great tyrant from the earth. As the receptacle of all things, it contains the shadows even of trees and kingdoms. It is described as all-devouring, remorseless, insatiable. There can be no doubt of the existence of an idea—however vague—if not of immortality, in the modern sense, yet of some state after life among the Hebrews, even in the earliest times.

For the Gehenna (Ge-Hinom) of the New Test., see **Hell**: for the Heb. *Sheol* of the Old Test. as more or less corresponding to the Gr. *Hades* of the New Test., see **Hades**.

SHEPARD, *shĕp′ėrd*, **Charles Upham, ll. d.**: mineralogist: 1804, June 29—1886, May 1; b. Little Compton, R. I. He graduated at Amherst Coll. 1824; assisted Prof. Silliman 1827–31; lectured on nat. history at Yale 1830–47; prof. of chemistry in S. C. State Medical College 1834–61; prof. of chemistry and nat. history in Amherst 1845–52, and lecturer on nat. history till 1877. He made a report to the govt. on sugar-culture in the south 1833; discovered important deposits of phosphate of lime near Charleston; and assisted in the geol. survey of Conn. 1835. He discovered several new minerals, and made valuable collections of minerals and meteorites, which were secured by Amherst College. He prepared several reports on the mines of the United States, contributed numerous papers on meteorites and other scientific subjects to the *American Journal of Science*, and pub. *Report on the Geological Survey of Connecticut* (1837); and *Treatise on Mineralogy* (enlarged ed. 1855).

SHEP′ARD, Thomas: Puritan minister: 1605, Nov. 5—1649, Aug. 25; b. Towcester, England. He graduated m.a. at Emmanuel College, Cambridge, 1627, and was ordained in the Church of England; but in 1630 was silenced for non-conformity, and soon afterward became tutor and chaplain in the family of Sir Richard Darby. In 1635 he emigrated to Mass., reaching Boston Oct. 3; and 1636, Feb., he succeeded the Rev. Thos. Hooker as pastor of the First Church in Cambridge, which position he held until his death. He was one of the founders of Harvard, and during his life took active interest in its welfare. Among his works are *New England's Lamentation for Old England's Errors* (London 1645); *The Sound Believer* (1645); *The Clear Sunshine of the Gospel Breaking forth upon the Indians in New England* (London 1648); *Theses Sabbatic* (1649). He died at Cambridge. He left many manuscripts, including an autobiography, which with his published works appeared in 3 vols. in Boston 1853, with a sketch of his life and character by Rev. Dr. Alger. Cotton Mather published a life of S. in *Magnalia Christi Americana*.

SHEP′ARD, William: soldier: 1737, Dec. 1—1817, Nov. 11; b. near Boston. He served in the provincial army 1757–63, reaching the rank of capt., and taking part in the battles of Fort William and Crown Point. He was appointed col. in the revolutionary army 1777, and served through the war, gaining reputation for bravery. As brig. gen. of militia he defended the arsenal in Springfield, Mass., at the time of Shay's rebellion. He was a member of congress 1797–1803.

SHEPHERD, n. *shĕp'ĕrd* [from *sheep*, and *herd*]: a man employed in tending sheep while pasturing; a swain; sometimes applied to a pastor or minister of the gospel. SHEP'HERDESS, n. *-ĕs*, a female who attends sheep while pasturing. SHEPHERD'S CROOK OR STAFF, a rod or staff armed with a blunt iron hook. SHEPHERD-KINGS, anc. race of kings who are said to have conquered Egypt, called usually Hyksos (q.v.). SHEPHERD'S-PURSE, common weed (see below). SHEPHERD'S ROD OR STAFF, a plant known as the TEASEL (q.v.).

SHEP'HERD'S DOG, or SHEEP-DOG: most useful and valuable of all kinds of dog, and employed by shepherds throughout Europe and in the countries colonized from Europe, also in parts of Asia, to assist them in tending their flocks. Without it, the shepherd would be incapable of taking care of the great number of sheep often under his charge; and the expense of keeping the requisite number of shepherds would more than cancel the profits of sheep-farming. That the dog was employed in tending sheep in very ancient times, we learn from the allusion to the *dogs of the flock* in Job xxx. 1. Buffon imagined the shepherd's dog to be the original of all the domesticated dogs; but was unable to show ground for the opinion. The S. D. shows nearly the same characters in all parts of Europe, though there are slight diversities in different countries, as between that of England and that of Scotland known as the *Collie*. It is of medium size—differences of size, however, being among the characteristics of different races; of rather slender form, with a rather sharp muzzle; the ears erect, or, in some races, drooping at the tip; the hair soft, long, shaggy, and somewhat waved; the tail slightly pendulous, more or less recurved, and very bushy; the feet well protected by hair so as to be adapted for rough ground. The eye is very bright and intelligent, though the ordinary demeanor of the animal is remarkably calm and quiet. No kind of dog is more intelligent, and perhaps none so docile; as is shown by its ready comprehension of the meaning of its master, its prompt obedience to his word or gesture, and its evident knowledge of what is requisite to be done. A S. D. exerts the utmost care to prevent sheep from straying off the road along which they are being driven, and sets itself, often of its own accord, to watch any gate or gap in the fence, or goes immediately to bring back stragglers. It is equally useful on the bleak moor or wild mountain, readily going for sheep, and bringing them from a distance. The sheep become perfectly acquainted with it, and evidently regard it as a friend, though the appearance of any other dog would alarm them at once. It knows the sheep of the flock which it is required to attend, and even in a crowded market adroitly separates them from others with which they have become mingled. Its remembrance of places is obviously accurate; and a dog which has found great difficulty in conducting sheep through crowded thoroughfares, does his work in the same locality much better on subsequent occasions. The intelligence of the S. D. has sometimes been proved remarkably by dishonest masters employing them to steal sheep. More frequent instances are on record of the S. D. conducting a flock of sheep safely home for many miles, unaccompained by the shepherd. The S. D. is affectionate, and becomes strongly attached to its master, but is generally shy to strangers. It is very muscular and active. The southern sheep-dog has shorter hair and a shorter tail than the northern one. The S. D. is often crossed with other kinds of dog, particularly with the pointer and setter; and such dogs may be used both as shepherds' dogs or for pursuit of game. The *Drover's Dog*, if not a distinct variety, is such a cross: it is apt to be somewhat cruel in temper.

Shepherd's Dog, or Collie.

SHEP'HERD'S PURSE (*Capsella*—formerly *Thlaspi—Bursa Pastoris*): annual plant of nat. order *Cruciferæ*, a most abundant weed, and remarkable as one of the few plants found over almost the whole world, adapting themselves to almost all soils and climates. It is a very variable plant, 3 inches to 2 ft. in height, with root-leaves more or less pinnatifid, all the leaves more or less toothed, and rough with hairs. The root-leaves spread closely along the ground. The flowers are white and diminutive. The pouch, from which the English name seems derived, is laterally compressed, and somewhat heart-shaped.

SHEPLEY, *shĕp'lĭ*, GEORGE FORSTER, LL.D.: soldier: 1819, Jan. 1—1878, July 20; b. Saco, Me. He graduated at Dartmouth Coll. 1837; was admitted to the bar 1840, and practiced in Bangor and Portland, Me. He was U. S. dist.-atty. 1853–61; delegate to the national democratic convention 1860; commissioned col. 12th Me. vols. 1861; took part with Gen. Butler in the capture of New Orleans, and was appointed milit. commandant and acting mayor of the city. In 1862 he was made brig.-gen. and milit. gov. of La.; commanded the milit. dist. of Va. and N. C. 1864; served with the Army of the James 1864-5, and was first milit. gov. of Richmond. After the war he resumed law practice in Me., and was U. S. circuit judge 1869 till his death.

SHEPPEY, *shĕp'pĭ*, Isle of: portion of the county of Kent, England; insulated from the mainland by the Swale, an arm of the estuary of the Medway; nine m. long, and four m. broad. In early times its dimensions were much greater, but the sea has encroached upon, and is gradually eating away the n. shore, which is lined by cliffs of London clay 60 to 80 ft. in height. The church of Minster, formerly in the middle of the island, is now on the n. coast. Great numbers of interesting fossils are found in the London clay, of which the whole island is composed. In the n. of the island, corn is grown, but the s. districts, which are low, are laid out in grass. Almost the whole of the inhabitants are massed in the seaport of Sheerness (q.v.).

SHEPTON MALLET, *shĕp'ton măl'ĕt*, local pron. *shĕp'on:* ancient market-town of Somersetshire, England; 5 m. e.s.e. of Wells. Its grammar school was founded 1627. Worsted stockings, crape, serge, and velvets are manufactured. It contains several large breweries. Pop. (1871) 5,149; (1881) 5,322; (1891) 5,501; (1901) 6,000.

SHERBET, n. *shėr'bĕt* [Ar. *sharbat*, a drink or sip, a beverage—from *shariba*, to drink: It. *sorbetto;* F. *sorbet*]: favorite beverage in the East, taking the place of stimulating drinks forbidden in Mohammedan countries. It is composed of the juice of various fruits sweetened and flavored; in England, made usually from white sugar, bicarbonate of soda, tartaric acid, and a flavoring essence. In this country the name is sometimes applied to various kinds of ices used for dessert.

SHERBORNE, *shĕr'bėrn:* market-town of Dorsetshire, England; on the river Yeo, 18 m. n.n.w. of Dorchester. It was the Saxon Scireburn, 'clear brook.' The King's School, founded 1550, has an endowment of nearly £1,000 a year, and several exhibitions tenable at either of the great English universities. There are several silk-throwing mills. Pop (1881) 5,053; (1891) 3,741.

SHERBROOKE, *shėr'brûk:* city in the province of Quebec, Canada; on the Magog and St. Francis rivers, and on the Grand Trunk, the Canadian Pacific, the International Passumpsic Waterloo and Magog, and the Quebec Central railways; 101 m. e. of Montreal, 121 m. s.w. of Quebec. It is the centre of an important agricultural region; has gas and electric light plants and good water; derives excellent water-power from the Magog river, which here descends 120 ft. within ½ m.; and has numerous manufactories, including woolen-mills, saw-mills, iron-foundries, machine-shops, and bobbin, corset, furniture, and carriage factories. It is the seat of a Rom. Cath. bp., and has a palace, cathedral, and two district churches, and 2 Anglican, 1 Meth., 1 Presb., 1 Congl., and 1 Bapt. churches. There are 13 hotels, 4 newspapers, Rom. Cath. hospital, Prot. hospital, and good public schools under joint Prot. and Rom. Cath. trustees. S. has considerable export-trade with the United States in lumber, pulp, asbestos, and live-stock. Pop. (1890) 10,000; (1901) 11,765.

SHER'BROOKE, Viscount: see LOWE, ROBERT.

SHERD, n. *shĕrd* [see SHARD]: a fragment, as of an earthenware vessel.

SHERE A'LI: see AFGHANISTAN.

SHERIDAN, *shĕr'ĭ-dan,* PHILIP HENRY: distinguished general of the civil war: 1831, Mar. 6—1888, Aug. 5; b. Albany, N. Y. (some authorities say Somerset, O.); of Irish descent. His boyish fondness for ‘playing soldier’ foreshadowed his military bent. He worked for a time as a clerk, and in 1848 secured an appointment to West Point Milit. Acad., but did not graduate till 1853, having been suspended for one year on account of a quarrel with another student. On graduation he was appointed 2d lieut. 1st infantry; went into garrison at Newport Barracks, Ky.; was ordered to Texas 1854; and served in Or. and Wash. Terr. 1855–61, reaching rank of capt. 1861, May. He found his way east in the fall; acted as chief quartermaster and commissary of the Army of the Southwest in the winter 1861–2, and held a similar position at Gen. Halleck's headquarters in the Miss. campaign; but resigned the uncongenial task, and became col. of the 2d Mich. cav. 1862, May, in time to make a raid on Booneville and assist in the pursuit of the Confederates from Corinth (q.v.). He defeated a superior cavalry force at Booneville July 1; and was appointed brig.gen. vols., and transferred to the Army of the Ohio. He distinguished himself at Perryville, where he commanded a division, Oct. 8; marched to the relief of Nashville; and was given a command in the Army of the Cumberland. At Murfreesboro (q.v.), 1862, Dec. 31, 1863, Jan. 2, he made a desperate resistance when division after division had been driven back; and though his ammunition gave out and he was forced to draw back, he had given Rosecrans time to make a new disposition of his troops, and to defeat Bragg's project of crushing the Federal right. S. was appointed maj.gen. vols. to date from this battle.

During the summer he was engaged in skirmishes against Van Dorn and Forrest, and crossed the Cumberland Mts. and the Tennessee river with Rosecrans's army in pursuit of Bragg. In the battle of Chickamauga (q.v.), Sep. 19–20, his division made desperate resistance. Gen. Grant superseded Rosecrans, arriving at Chattanooga Oct. 30, and S. was prominent in the battles that followed (see CHATTANOOGA, BATTLES OF). After carrying the intrenchments at the foot of Missionary Ridge, he impetuously pursued the enemy across the summit and down the other side. In this action first he attracted the special attention of Gen. Grant, who declared him the very man whom he wanted to command the cavalry of the Army of the Potomac, whither he was transferred 1864, April 4. He was in the battle of the Wilderness May 5–6, and May 9–24 with his accustomed skill and dash conducted a raid in advance of the main army to cut off the Confederate line of communication with Richmond. During May, June, and July, he fought 18 battles, in addition to protecting the flanks of the army and reconnoitering the enemy's position. At Yellow Tavern, May 11, he won a victory over the cavalry gen. J. E. B. Stuart, who was mortally wounded in the engagement. The battle of Hawes's Shop took place May 28, and Cold Harbor May 31. June 7 two divisions of cavalry under S. started out to destroy the Virginia Central railroad, defeated Wade Hampton June 11 near Trevilian Station, tore up the railroad east and west, and rejoined the army June 19.

In Aug. S. took command of the Middle Milit. division. The work before him was to drive the enemy out of Va., destroy the stores, and relieve the apprehension felt at Washington. The opposing armies lay near each other. The Confederates, commanded by Gen. Early, held the w. bank of Opequan creek, and protected Winchester. Gen. Grant visited S. at this time, and, finding him so enthusiastic and confident, left the conduct of the campaign with him, not showing the plan which he had brought. S. attacked Early at the crossing of the Opequan Sep. 19, and drove him through Winchester, capturing 5,000 prisoners; overtook him and again defeated him, Sep. 22, at Fisher's Hill, pursuing him to the mountains, and devastating the valley on his return. These actions gained him the promotion of brig.gen. U. S. A. Early was reinforced by troops from Gen. Longstreet's command, and Oct. 18, by a rapid and secret march, he surprised the Union troops. S. had been absent in Washington, and on his return had reached Winchester, 20 m. from the scene of struggle. He heard the sound of firing, met stragglers from the routed Union army, and quickly comprehended the situation. Spurring his horse, and shouting to the retreating soldiers, 'Face the other way, boys; we are going back!' he galloped to the front, rode up and down the lines to inspire the men with his presence, attacked the enemy vigorously, recaptured prisoners and arms, and turned disaster into one of the most famous victories (see CEDAR CREEK, BATTLE OF). S was made maj.gen. U. S. A. for 'personal gallantry, military skill, and just confidence in the courage and patriotism of his troops' displayed at this time. After driving the Confederates out, S. devastated the Shenandoah valley, destroying barns, crops, and factories; in Feb. he received the thanks of congress for his conduct of this campaign.

In 1865, Feb. 27—Mar. 24, with 10,000 cavalry, S. raided the country from Winchester to Petersburg, destroying the James River and Kanawha canal, and tearing up and burning railroads and bridges. At Waynesboro he assaulted the Confederate works under Gen. Early, and secured 1,500 prisoners and 11 pieces of artillery; and Mar. 27 rejoined Grant, under whose direct command he was engaged in all the battles of the Army of the Potomac till the surrender of Lee's forces. Lee had sent out men to protect the railway connections on which he depended for supplies. S attacked them near Dinwiddie Court-House, and advanced toward Five Forks, but Mar. 31 was forced to fall back to Dinwiddie. Being reinforced and given additional command, he again advanced on Five Forks, Apr. 1, and utterly routed the Confederates (see FIVE FORKS, BATTLE OF). Lee withdrew from Petersburg the next day. S. pursued the retreating army; participated in the battle of Sailors' Creek Apr. 6, and minor engagements; and was present at the surrender of Lee's army at Appomattox Court-House.

He took command of the milit. division of the Gulf 1866, July; and when it was made the dept. of the Gulf continued in command till 1867, Mar.; was in charge of the La. and Tex. milit. dist. Mar.—Sep., and of the dept. of the Mo. 1867, Sep.—1869, Mar., with headquarters at Fort Leavenworth, where he carried on an Indian campaign. On the inauguration of Pres. Grant, 1869, Mar. 4, S. was promoted lieut.gen., and given command of the division of the Mo., with headquarters at Chicago. In 1870 he visited Europe to watch the conduct of the Franco-Prussian war; in 1875 went to La. to repress political disturbances there. In 1883, on Sherman's resignation, S became gen.-in-chief of the army, and in 1888, by special act of congress, was made general, which rank in the U. S. army had previously been held by only Washington, Grant, and Sherman.—S. was below medium height, but broad-shouldered, and with a self-possessed and resolute bearing. He was admired and loved by his men, who affectionately called him 'Little Phil.' He died at Nonquitt, Mass., and was buried in the national cemetery at Arlington.

SHER'IDAN, RICHARD BRINSLEY BUTLER: dramatist: 1751, Sep.—1816, July 7; b. Dublin; second son of Thomas S., lecturer on oratory and elocution, and compiler of an English dictionary. He was sent to school at Harrow, where he gave no promise of the brilliancy which he afterward displayed. He does not seem to have been brought up to any regular employment; and after his elopement and marriage, 1773, with Miss Linley, a public singer of great beauty and accomplishment, his prospects did not seem bright, especially as he insisted, on a point of pride, that his wife should give up her profession. However, he found means to take and furnish a good house in London, to which his own brilliant social qualities and his wife's beauty and wit drew a large number of people prominent in society or in literature. To literature, as the readiest resource, he now betook himself. The lighter drama was the sphere which attracted him, and 1775, Jan., his first comedy, *The Rivals*, was produced. Almost a failure on its first appearance, through poor acting of the part of Sir Lucius O'Trigger, this piece on its repetition found the favor with the public which its wit and vivacity deserved, and which it has retained to this day. It made the reputation of the writer. In the year following, S. followed up his success by a farce of no very great merit, *St. Patrick's Day, or the Scheming Lieutenant*, and a second comedy, *The Duenna*, amid the sparkling dialogue of which are interspersed some songs of exquisite merit. He now became, in some unexplained manner—for though his pieces were most successful, they could scarcely have brought him the necessary funds—part-proprietor of the Drury Lane Theatre. Garrick's half-share was purchased (1776) for £35,000, of which S. contributed £10,000; and 1777 his *School for Scandal* was produced there. This, by much his greatest, or at least most popular, production, instantly leaped into the popularity which it has ever since retained. His other works for the stage were the inimitably clever farce, *The Critic* (1779), and, after a long interval, *The Stranger* and *Pizarro* (1798), both adapted from the German of Kotzebue. During this interval he was deeply engaged in politics. S.'s wit and sprightliness coruscated in society as brightly as in his comedies; he was an admired table-companion. With Fox (then in power) and his wild set, these gifts made him a prime favorite; and through the influence of Fox, 1780, he was returned to parliament for the borough of Stafford. In his politics he faithfully followed Fox; and the whig party from time to time had good service from their brilliant recruit. He never failed to amuse the house; and when stirred by the trumpet-call of a great occasion, he was capable of rising to heights of noble eloquence. In particular, his famous speech urging the impeachment of Warren Hastings (q.v)., is still traditionally remembered as perhaps the grandest triumph of oratory in that stirring time (see W. Fraser Rae's *Wilkes, Sheridan, and Fox,* 1874).

In 1792, S. lost his wife; and three years later, he married Miss Ogle, who brought him £5,000—a sum to S. no doubt welcome, though a small relief to the pecuniary difficulties in which he had now become involved, and which more and more accumulated on him. Always gay and improvident he did not improve with time. His later years were years of dismal struggle, of which debt, duns, and dissipation may furnish a convenient alliterative summary. His health failed with his fortunes; and his friends, not finding him in his sickness and adversity so amusing as formerly, naturally failed him also—notably and shamefully, the Prince Regent, whose dull brains over the winecup he had so often brightened. Some honorable exceptions there were; among them the poets Rogers and Moore, steadily kind to him to the last. He died in London.

See his biography by Moore (questioned at some points by some writers); Hazlitt's *Lectures on the Comic Writers;* and Mrs. Oliphant's *Sheridan* in the English Men of Letters series (1883). A good edition of his works, ed. by F. Stainforth, was pub. 1874.

SHERIDAN, Thomas: 1721–1788, Aug. 14; b. Quilca, near Dublin; son of Thomas S., D.D., and father of the dramatist, Richard Brinsley S. After education at Trinity Coll., Dublin, and appearances on the stage there and in London, in both which places he was also manager of theatres, he won fame as lecturer on elocution and as author. His works include *British Education* (1756); *Lectures on Elocution* (1762); *Lectures on the Art of Reading* (1775); *General Dict. of the Eng. Language* (1780, 2 vols., with special reference to pronunciation, and with a rhetorical grammar prefixed); *Elements of English* (1789); *Lectures on the Reading of the Church Liturgy* (1829). He wrote also a life of Swift, whose works he edited.

SHERIF, or SHEREEF, *shĕ-rēf'* (properly SCHERIF, q.v.): among Moslems, title of a descendant of Mohammed, through his daughter Fatima and Ali. The title is inherited from both the paternal and maternal side; thus the number of members of this aristocracy is very large among the Moslems. The men have the privilege of wearing green turbans, the women green veils, and they mostly avail themselves of this outward badge of nobility—the prophet's color—while that of the other Moslems' turbans is white. Many of these sherifs founded dynasties in Africa; and the line now ruling in Fez and Morocco boasts this proud designation.

SHERIFF, n. *shĕr'ĭf* [AS. *scir-gerefa*, gov. of a shire—from *scir*, a shire: *gerefa*, a reeve or sheriff (see SHIRE and REEVE 1)]: in the *United States* and in *England*, chief officer of a county or shire, to whom is intrusted the execution of the laws; in *Scot.*, chief civil officer of a county, sometimes of a city or burgh which is itself a county, who (unlike the sheriff in England and the United States) has extensive jurisdiction as a judge within his own district, both in civil and criminal matters: he is one of three county officials so named, all appointed by the crown. SHER'IFFSHIP, n. the office or jurisdiction of a sheriff; also SHER'IFFDOM, n. and SHER'IFFALTY, n. *-ăl-tĭ*. SHERIFF-DEPUTE, in *Scot.*, formerly a sheriff who acted for the hereditary or high sheriff, whose office corresponded very nearly to the modern sheriff-substitute, but who is now, since the abolition of hereditary sheriffs, the principal sheriff of a county. SHERIFF-OFFICER, in *Scot.*, one who is charged with arrests and the service of processes, etc.; a catch-poll. SHERIFF-PRINCIPAL, in Scotland, the lord-lieut. of the county. SHERIFF-SUBSTITUTE, in *Scot.*, a civil officer or judge under the sheriff-depute. SHERIFF'S CLERK, in Scotland, the registrar of the sheriff's court, having charge of its records.—The *Sheriff*, in the United States and in England, is an officer whose duties are now chiefly ministerial. The office is of great antiquity, one of the few which may be traced back to Saxon times, and it appears originally to have been the same both in England and in Scotland. The S. was (under the earl and next to the bishop) the chief man of the shire, and seems to have possessed unlimited jurisdiction to keep the peace; to have presided in all the courts; to have punished all crimes, and have redressed all civil wrongs. This extensive jurisdiction has been gradually infringed upon, partly by exercise of the royal prerogative, partly by parliament. In England, so purely honorary and ministerial has the office become, that it has been held by a woman, and in Westmoreland the office was hereditary till 1849. The woman referred to was Anne, Countess of Pembroke—stauch royalist during the rebellion in the time of Charles I. and II.—who succeeded to the hereditary office of S. of Westmoreland 1643. The duty of enforcing the orders of the supreme courts, which now in England is a principal part of the duties of the sheriff, appears to have been engrafted on the office—probably on the theory that these orders were those of the king himself. The crown now appoints to the office. A S. continues in office one year only, and cannot be compelled to serve a second time. The office is not only gratuitous, but compulsory. In practice, country gentlemen of wealth are appointed. In the city of London, the sheriffs are appointed not by the crown, but by the citizens. The S. has important official duties in elections of members of parliament. He is, by his office, the first man in the county, and superior to any nobleman while he holds office. He has the duty of summoning the *posse comitatus*—i.e., all the people of the county—to assist him in the keeping of the queen's peace. His chief legal duty is that of executing all the judgments and orders of the courts of law. It is he who, through his bailiffs, seizes the goods of debtors or their persons, and puts them in prison.

In the United States the S. as an executive officer has functions very similar to those of the S. in an English county, though his office has no such honor. He is usually elected by popular vote. The functions of sheriffs are exercised for the United States govt. by U. S. marshals appointed for each state by the president. The deputies of a S. are responsible only to him, while he is responsible to the executive authorities and to the public.

SHERIFF-MUIR, *shĕr-ĭf-mür':* name given to several moors in Scotland on account of the 'wapinschaws' formerly there held, under superintendence of the sheriff. The only moor of this name prominent in Scottish history is in Perthshire, on the n. slope of the Ochils, 2 m. n e. of Dunblane, and was the site of the great battle between the adherents of the Houses of Stewart and Hanover, 1715, Nov. 13. The former, who consisted of the n. clans under the Earl of Seaforth and the w. clans under Gen. Gordon, numbering about 9,000 in all, were on their march southward under leadership of the Earl of Mar, to join the Jacobites who had risen in n.w. England, when they were met by the Duke of Argyle at the head of 3,500 disciplined troops. After lying under arms all night, the Macdonalds, who formed the centre and right of the Highland army, attacked the left of their opponents, and routed it so completely that the fugitives fled with all speed to Stirling, parrying the news that Argyle had been totally defeated. Argyle, however, with his dragoons, had meantime driven the left of the Highlanders back two miles, when the right and centre returned from the pursuit, and took him in rear; he then skilfully withdrew his men to a place of shelter, and remained facing his opponents till the evening, when he retired to Dunblane, and next day to Stirling. About 500 were slain on each side. As a mere battle, the victory lay with the Highlanders; but it was so little decisive that it paralyzed the action of the Jacobites almost as effectually as a defeat would have done.

SHERLOCK, *shĕr'lok*, THOMAS, D.D.: English prelate: 1678–1761, July 18; b. London, son of Dr. William S., Dean of St. Paul's. He was educated at Eton, and Catharine Hall, Cambridge, where he took the degree M.A. 1701. In 1704 he obtained the mastership of the temple; 1714 became vice-chancellor of his college, taking the degree D.D.; 1716, dean of Chichester Eleven years later he was raised to the see of Bangor, was transferred to that of Salisbury 1734, and 1748 to that of London. S. was a strenuous tory, and supported the church-and-state politics of his day with a dull dignity. He showed diplomatic skill in his different official positions, whence Bentley nicknamed him 'Cardinal Alberoni;' his eloquence and learning were likewise of a high order, as is still evidenced by his 4 vols. of *Sermons* (1755–76), praised in their day.

SHERMAN, *sher'man*: city, cap. of Grayson co., Tex.; on the Texas and Pacific, the Houston and Texas Central, and the St. Louis Arkansas and Texas railroads; 13 m. s. of Red river, 270 m. n.-by-e. of Austin. It is in a wheat, fruit, and cotton region; contains 8 churches, high and grammar schools, co. court-house, 3 national banks (cap. $800,000), 1 state bank (cap. $300,000.), Sherman Female Inst., Austin College (Preb.), and 2 daily and 3 weekly newspapers; and is a general trade centre for a large territory. Pop. (1890) 7,320; (1900) 10,243.

SHERMAN, *shĕr'man*, JOHN: minister: 1613, Dec. 26—1685, Aug. 8; b. Dedham, England. He graduated from Cambridge Univ. 1633; came to Conn. 1634; was chosen magistrate of that colony 1641; and was pastor of the First Church (Congl.) at Watertown, Conn., 1649 till his death. He was an eminent mathematician, author of several almanacs, and for many years a lecturer at Harvard College.

SHER'MAN, JOHN: statesman: b. Lancaster, O., 1823, May 10; bro. of Gen. William T. S. (q.v.). His father died when he was six years old, and he was taken into the family of John S., a cousin. When 14 years of age he was prepared to enter the sophomore class in college; but, preferring independence, he began work with the engineer corps on the Muskingum improvement. After two years he lost this place through political changes, and began the study of law with his brother Charles S. at Mansfield, O.; was admitted to the bar 1844, and entered into partnership with his brother. He was a delegate to the national whig convention 1848, and again 1852; was active in the organization of the republican party, and was pres. of the first Ohio republican state convention. He was a member of congress 1855–61, during which time he took part in the important debates on the Missouri Compromise, the Dred-Scott decision, slavery in Kansas, the Fugitive Slave Law, and questions of finance. His service on the committee sent to investigate the troubles in Kansas consequent on the slavery agitation gave him prominence. On account of the sickness of the chairman, he presented its report, which had important influence in the presidential campaign of 1856. Mr. S. kept a close watch on the appropriation bills of the house, pushed the investigation of alleged navy-yard abuses, and opposed the system of making contracts in advance of appropriations. On his failure to obtain the speakership of the 36th congress after an exciting contest of eight weeks, he was appointed chairman of the committee of ways and means. He made a vigorous protest against changes in existing laws by amendments on appropriation bills; and to relieve the financial distress of the govt. secured the passage of the bill authorizing the issue of the treasury notes of 1860. He was elected to the senate 1861 to succeed Senator Chase. At the breaking out of the civil war he served as aide-de-camp to Gen. Patterson till congress met in extra session July 4. In the interval of his congressional duties he returned to Ohio, and organized the 'Sherman Brigade,' which served throughout the war. He purposed to enter the army, but was persuaded by Pres. Lincoln and Sec. Chase to remain in the senate, where he did notable service in strengthening the public credit and providing for support of troops. He urged that U. S. notes should be made legal tender, and with Sec. Chase succeeded in carrying through the National Bank Bill. His speeches on this debate are regarded as the most important which he made during the war. Senator S. was joint author with Thaddeus Stevens of the Reconstruction Act which divided the southern states into military districts. He proposed the refunding act of 1870, and to him more than to any other man was due the resumption of specie payments, 1879, Jan. 1. Mr. S. was sec. of the treasury under Pres. Hayes 1877–81 ; a prominent candidate for the presidency 1880 and again 1888. He was re-elected to the senate 1881 and 1893. In 1898 he was sec. of state of the U. S. His long public career was notable for integrity and unselfish service, as well as for statesmanlike grasp of leading principles, and skillful treatment of practical details in public affairs. *Recollections of Forty Years in the House, Senate, and Cabinet*, an autobiography, appeared 1895. He died 1900, Oct. 22.

SHER'MAN, Roger: signer of the Declaration of Independence: 1721, April 19—1793, July 23; b. Newtown, Mass. He worked as shoemaker till he was 22 years old, meanwhile educating himself in law, mathematics, and politics. He was admitted to the bar 1754; elected to the gen. assembly of Conn. 1755; was a member of the upper house of the Conn. legislature 1766–85; judge of the superior court 1766–89; and member of the continental and U. S. congresses 1774–91. In 1776 he was on the committee to draw up the Declaration of Independence, and was one of its signers. He assisted Judge Richard Law in codifying the laws of Conn. 1783; was a member of the convention which framed the U. S. constitution 1787; and was prominent in the Conn. state convention which ratified it. He was mayor of New Haven 1784–93; and U. S. senator 1791 till his death. He died in New Haven. S.'s calm clear judgment was of great value in the administration of affairs in that time of storm and trial.

SHER'MAN, Sidney: soldier: 1805, July 23—1873, Aug. 1; b. Marlborough, Mass.; descendant of Roger Sherman. He engaged in business in New York and in the west, and 1835 took arms in the struggle for Texan independence. He commanded the left wing and led the attack on the Mexican line at the battle of San Jacinto 1836, with the battle-cry, 'Remember the Alamo!' He was commissioned col. in the regular army, and sent on a mission to Ky.; returned to Tex., and was elected to congress 1842; obtained the first charter for a Texan railroad 1846: and 1854, on the anniversary of San Jacinto, he introduced the first locomotive w. of the Mississippi. In the civil war he planned the defenses of Galveston.

SHER'MAN, Thomas West: 1813, Mar. 26—1879, Mar. 16; b. Newport, R. I. He graduated at West Point Milit. Acad. 1836; was engaged in the Seminole war in Fla. till 1842; served in the Mexican war, and was brevetted maj. for gallantry at Buena Vista. He served on the frontier till the beginning of the civil war; was promoted brig.-gen. vols. 1861, May; planned an expedition for seizing Bull's Bay, S. C., and Fernandina, Fla.; commanded the land troops in the Port Royal expedition 1861, Oct.—1862, Mar.; took part in the siege of Corinth, and served before New Orleans. He was brevetted brig.gen. U. S. A. for gallantry in the assault on Port Hudson, La., 1863, May, where he lost his right leg. After 9 months' leave of absence he again served in La. After the war he held commands at Fort Adams, R. I., and Key West, Fla. He was retired maj.gen. 1870.

SHER'MAN, William Tecumseh: 1820, Feb. 8—1891, Feb. 14; b. Lancaster, O.: distinguished soldier of the civil war. He was descended from the Rev. John S., who came from England to Watertown, Mass., 1634, in company with a cousin, Capt. John S., from whom were descended Roger S., William M. Evarts, and other eminent men. The father of William T. S., Charles R. S. (son of Judge Taylor S. of Norwalk, Conn.), married Mary Hoyt, migrated to Lancaster, O., became judge of the supreme court, and died 1829, leaving many children, of whom John S. became the distinguished congressman and sec. of the treasury. William T. S., left fatherless at 9 years of age, was informally adopted by Thomas Ewing; studied in Lancaster Acad , and entered West Point 1836; graduated with class-rank number six; was appointed second lieut. 3d artillery; served in the garrison duty and skirmishing of the Seminole war 1840–1, when he was made first lieut.; and was afterward on duty at Mobile and Charleston. In 1844, assisting Col Churchill in taking depositions of losses in Florida by volunteers, he travelled through upper Ga. and Ala., acquiring knowledge of the country, afterward of great use in his campaigns. In 1846, after recruiting at Pittsburgh for the Mexican war, he sailed with troops July 14 from New York for California, arriving at Monterey 1847, Jan. 26, whence, soon after, as aide to Gen. Kearny, he travelled largely in California, and assisted in settling its disturbed affairs, subsequently becoming adjt.gen of Col.

Mason, who was commander of land forces after Gen. Kearny's departure; and afterward aide of Gen. P. F. Smith. In 1850 he returned by Panama; married a daughter of Thomas Ewing, then sec. of the interior; was promoted to captaincy in the commissary dept., and stationed at St. Louis until transferred to New Orleans 1852. Invited to become partner in a new banking-house (Lucas, Turner & Co., San Francisco), he went thither early in 1853, on leave of absence—the steamship being wrecked near destination, without loss of lives, and he experiencing another wreck the same day while passing the Golden Gate on a schooner. Resigning his commission after six months, he brought his family to San F ancisco. By his wise energy, his bank went safely through the financial panic there in 1855. In 1856, May, he agreed to accept a commission as maj.gen. of the militia, but declined when Gen. Wool repudiated a promise to furnish arms on Gov. Johnson's requisition, for the purpose of suppressing the Vigilance Committee, which was then dealing actively with public affairs, outside the forms of law. Banking and other business in Cal. having become unsettled, the bank was discontinued 1857, at the recommendation of S., who returned east, and resumed the business under the same firm-name, 12 Wall st., New York; but, in the great financial crisis of 1857, the principal partner, in St. Louis, was obliged to suspend, and the New York house, though meeting all its obligations, was wound up. In 1858–9 S. was the business law-partner with two sons of Thomas Ewing, in Leavenworth, Kan., also opening a farm near there. 1859, July, he was elected supt. of a new milit. college near Alexandria, La., and labored efficiently for it until the opening events of the civil war compelled him to resign, leaving for the north 1861, Feb. 25, and the next month settling in St. Louis as pres. of the Fifth St. railroad, after his services had been virtually declined at Washington.

However, in May he addressed the war dept.; was appointed col. of the 13th regular infantry; and was assigned to inspection duty at Washington, by Gen. Winfield Scott, 1861, June 20; but, 10 days afterward, he was appointed to command the 3d brigade, 2d division, mostly New York vols., and held his ground in front at the first battle of Bull Run until he learned that the Union army was in retreat. Promoted to brig.gen. of vols., he was assigned 1861, Aug. 24, as 'right-hand' man to Gen. Robert Anderson (at the latter's request), commanding the dept. of the Cumberland—including the critical state of Ky., then neglected while threatened by secession forces in Tenn. After visiting the governors of Ind. and Ill., and Gen. Fremont at St. Louis, to divert to Ky. some of the enlisted forces, he was compelled, against his wish, to assume chief command, by Gen. Anderson's relinquishment on account of ill health. At Louisville he was visited by the sec. of war, Cameron, to whom he explained that, with 300 m. of frontier, against able opposing generals and forces, he needed 60,000 men for defense, or 200,000 for aggressive movements, instead of 18,000 with poor Belgian muskets. A memorandum of this estimate by Gen. L. Thomas as 'insane' was seen and published by the inevitable marplot, a newspaper correspondent at Washington, and started the cruel story of S.'s insanity; and it seems never to have been corrected by Cameron. Stung by this injustice, and not receiving more reinforcements promised, S. was relieved at his own suggestion (Gen. Buell taking his place), and ordered to report to Gen. Halleck at St. Louis, who contradicted further malicious rumors against S., gave him the credit of suggesting the great campaign up the Tennessee river, and placed him in command at Paducah, Ky., to co-operate with Gen. Grant, chief of the Army of the Tennessee. Organizing a division there of 4 brigades, S. took command; moved to Pittsburgh Landing, on the Tennessee; had part in the great battle of Shiloh, 1862, Apr. 6 and 7, vindicating his high ability as a general; and led in the attack on outworks that resulted in evacuation of Corinth by the enemy May 29. Orders from Washington led to long delay and scattering of the conquering force. July 16 S. was placed in command of the district of w. Tenn., with headquarters at Memphis, where he wisely met the problems of military rule. His next important command was that of the expedition down the Mississippi to capture Vicksburg; but the assault, Dec. 29, failed through disobedience to orders; Vicksburg was reinforced; and the expedition was diverted to the successful movement against Arkansas Post. S. commanded the 15th corps in the assaults on Vicksburg 1863, May, and in the victory at Jackson the next month. At this time a long reply of S. to a letter of inquiry from Washington contributed much to vigorous prosecution of the war beyond temporary victories to its legitimate end. Sep. 23 he was ordered with his whole corps to relieve Rosecrans at Chattanooga (after the latter's defeat by Bragg at Chickamauga), and Nov. 25 made the hard-fought flank movement on Missionary Ridge which prepared the way for breaking Bragg's centre. After his part in the victory (for which he received the thanks of congress), he fulfilled with energy the work of relieving Burnside at Knoxville. In 1864 S. made a bold push from Vicksburg, which resulted in breaking up Gen. (Bp.) Polk's headquarters at Meridian, Miss., cutting railroads, and clearing again the Mississippi river region. In March, Gen. Grant (made lieut.gen. and ordered to Washington) wrote to S.: 'My thanks to you and McPherson as *the* men to whom, above all others, I feel indebted for whatever I have had of success.' Gen. Grant's milit. div. of the Mississippi, embracing the depts. of the Ohio, Cumberland, Tenn., and Ark., was transferred to S., who, May 5, moved from Chattanooga with 100,000 men, pushing the enemy south by successive strategies and much hard fighting, until Atlanta was evacuated Aug. 31, which event contributed much to secure the re-election of Pres. Lincoln against compromisers.

After arranging for the defense of Tenn. and Ky., and long insistence on his bold plan. S. received, Nov. 2, the consent of Gen. Grant to 'march to the sea.' This famous movement is not to be depreciated because, as the event proved, it was very feasible. S. himself says that he regarded it as only 'the transfer of a strong army, which had no opponent, and had finished its then work, from the interior to a point on the coast'—'as one step in the direction of Richmond.' In fact, it cut the Confederacy in two, destroyed connecting railroads and bridges, brought war home to a deluded people, disheartened the enemy, and finally isolated the rebellion in Virginia. In connection with Gen. Grant's work there, it brought the war to a close. It was admirably prepared and conducted, the march beginning from Atlanta Nov. 15, and ending in the siege of Savannah, and its evacuation Dec. 20-21. S. received the thanks of congress. 1865, Jan 21, began his far more arduous progress northward—the campaign of the Carolinas—ending in concentration of forces at Goldsboro, N C, and (after the fall of Richmond and Petersburg, and the surrender of Lee to Gen. Grant Apr. 9) the surrender to S. of the rest of the eastern Confederate army Apr. 26. Certain acts of S. relating to the status of the secessionists were, on orders from Washington, revoked by himself, and are fully stated in his autobiographical *Memoirs*, which give a chapter also to the military lessons of the war. The great lesson of his own campaigns, however, is, that war is war, and must be aggressively conducted as such to its thorough conclusion.

After the war he was assigned to the milit. div. of the Mississippi (afterward Missouri), with headquarters at St. Louis, his honorary rank being the one lieut.gen. under the one gen. of the U. S. army—Grant. A mission to Mexico, and service on the Indian Peace Commission, followed. In 1869, March 4, on the inauguration of Pres. Grant, S. was made gen. of the army, and moved to Washington, afterward visiting Europe 1871-2, and the Pacific coast 1883, resigning his office the same year, Nov. 1, three months before its legal expiration; thenceforth on the retired list and living in St. Louis, but removing to New York 1886. In 1884 he positively refused to be candidate for the presidency of the United States. The death of his wife 1888 occasioned severe illness. Recovering from an attack of erysipelas 1891, Feb., exhaustion and his old malady, asthma, led to his death in New York Feb. 14. National mourning, and an imposing funeral in New York and St. Louis, in which latter city he was buried, were among the many public testimonies to the great soldier and noble man.

SHERRY, n. *shĕr'rĭ* [from *Xeres*, in Spain]: a rich, dry, white wine from Xeres, in Spain (see WINE). SHERRY-COBBLER, *-kŏb'lėr*, sherry mixed with pounded ice, powdered sugar, and lemon, partaken by being sucked through a straw or small tube. SHER'RIS, n. OE. for SHERRY. SHER'RYADE, n. *-rĭ-ād*, a pleasant summer beverage whose principal flavoring ingredient is sherry.

SHERWOOD FOR'EST, *shėr'wûd:* stretch of hilly country in w. Nottinghamshire, England; between Nottingham and Worksop; about 25 m. from n. to s., and 6 to 8 m. from e. to w. It was formerly a royal forest, the traditional scene of many of the exploits of the famous Robin Hood and his followers; but it is now almost wholly disafforested, and is occupied by gentlemen's seats and fine parks. The town of Mansfield and a number of villages are within the ancient bounds. Numerous remains of the old forest are still seen. The soil, principally a species of quartzose gravel, is in some places fertile, in others almost barren, and on the whole of moderate quality.

SHETLAND, *shĕt'land,* or ZET'LAND, anciently HIALTLAND, and presumably the *Ultima Thule* of the Romans: group of about 100 islands, islets, and rocks, 23 of which are inhabited; about 25 leagues n.e. of Orkney, 44 leagues w. of Norway; between the Atlantic and the North Sea, lat. 59° 51′—60° 50′ n., and long. 0° 53′—1° 15′ w.; but Fair Isle, which belongs to S. lies to the s., and is about midway between Orkney and Shetland. Area 551 sq. m. There are three chief islands: the largest or mainland, 60 m. long by 3 to 10 broad; Yell, 20 by 6 m, and Unst, 11 by 6 m. Pop. (1881) 29,705; (1891) 28,711; (1901) 27,755, and 5,444 inhabited houses. In 1881 the percentage of persons in receipt of education to the total population was 16.98. In 1881 only 4.9 per cent. of the births were illegitimate. Lerwick, 272 m. n. of Edinburgh, 95 n. of Wick, is the only town in S. It has a handsome town hall and court-house, custom-house, and other public offices, and about 70 shops; pop. about 4,000. It has a fine natural weekly in summer, weekly in winter, conveying passengers, mails, and most of the exports and imports of Shetland. Fort Charlotte is at the north end of the town, and adds to its picturesqueness. See old works on S. by Hibbert, Edmonston, and Cowie; and J. R. Tudor's *The Orkneys and Shetland* (1883). The chief imports are oatmeal, flour, tea, tobacco, spirits, sugar, cottons, woolens, timber (chiefly from Norway), tar, salt, etc £15,000 to £20,000 worth of breadstuff is imported annually to supply the deficiency of native grain. All classes consume much tea. No wood grows in the country. There entered the port of Lerwick (1880) 268 vessels, of 44,582 tons; cleared 220, of 39,327 tons. Scalloway and Hillswick are the largest villages. The chief exports are dried salted fish, about 3,000 tons annually, about a half to Spain; herrings, 4,000 to 10,000 barrels in the year; about 2,100 cattle and 600 ponies yearly; about 12,000 sheep (1878); eggs, of which 54,000 have been sent in one steamer; hand-knitted woolens of great beauty and fineness of workmanship; fish-oil; chromate of iron from Unst; copper ore from Sandlodge; iron pyrites formerly from Fitful when sulphur was dear. The exports exceed in value £100,000 annually.

Fishing for cod, ling, herring, is the chief industry; but each fisherman has usually a small farm, at £4 or £5 yearly rent, worked mostly by the females of his family.

In 1882 S. had 629 fishing-boats, 2,981 fishermen and boys. Seals and bottle-nosed whales are often caught. Nearly every house has a quern or hand-mill, and every township has one or more of the old Norse water-mills. The spinning-wheel is common, but the spindle is still in use in some parts. Carts are rare, and in many districts unknown. The sheep and ponies run at large on the Scatfield or Common, and have registered marks; but many large tracts have been inclosed and drained, and now rear first-class Cheviot and black-faced sheep. The *rivlin*, a sandal of untanned leather, is still worn. Some lands are still held runrig, and some islanders on the west still hold their stock as steel-bow. In certain districts, till a very late period, the poor, by the Norse law, went from house to house, and stayed a longer or shorter period in each, according to the size of the farm. The S. dialect is a soft and pleasant English, but contains many peculiar Norse words. Many of the people still eat their fish wind-dried and slightly tainted. Young men from S. are employed as sailors in the Peterhead and Dundee whalers, or at some of the large shipping ports of the kingdom. They are intelligent, sober, and sedate, and are much liked as seamen. S. is still subjected to the *truck* or barter system in local commercial transactions.

S. with Orkney forms a county, which sends one member to parliament. In 1881, S. had 5,244 horses, 19,117 cattle, 72,156, sheep, and 3,789 pigs; 10,774 acres in oats and barley, the only grain crops; and 763 acres in turnips. The native cattle, sheep, and horses (shelties or ponies) are small. Free landed property is termed udal, and the proprietor an udaller. S. has 14 civil parishes, with 23 Established churches, and 9 Free churches—all Presbyterian.

The surface is rugged and wild, largely sterile. The coasts are abrupt, and cut with deep bays or voes, and caves. The rocks are mainly gneiss, clay-slate, sandstone, granite, sienite, mica-slate, serpentine, and diallage. The highest hills are Ronas, 1,500 ft., and one of five in Foula, 1,400 ft. The coast cliff scenery is very fine, and none in Scotland surpasses that about Papa Stour. The climate is moist and variable. S.w., s., and n. winds prevail. The mean temperature for the year is 45°, for Jan. 39°, for July 53°, winter being warmer, and summer cooler than in s. Scotland. The mean annual rain-fall at Pressay is 38 inches, at East Yell, 50. The tide flows an hour earlier on the w. than on the e. side of Shetland. The prevailing diseases are dyspepsia, rheumatism, and catarrh. Infant mortality is not high. Idiocy and imbecility are frequent. Fair hair and blue eyes are very common.

Though we know little or nothing of the original inhabitants of S., the physiognomy, character, and language of the present point to a Norse or Scandinavian descent. In Unst, etc., have been found cairns over long and short stone coffins, with skeletons, clay urns, weapons, and stone vessels. Tumuli and burned stones and earth are frequent, and contain remains of rude buildings and stone implements. Circular strongholds of unhewn stone called burghs or 'broughs,' are very numerous, generally on a cliff or headland, but also on artificial islands in fresh-water lochs. Mousa Isle has the most perfect 'brough' known. In Sandsting occur very rude underground houses, with the rudest stone implements. In Bressay was found a stone of the Christian period, with an Ogham inscription. Monoliths are rather frequent. Stone circles are rare, and never large.

SHETLAND PONY: see SHELTIE.

SHEW, v. *shō:* another spelling of SHOW, which see.

SHEW-BREAD, *shō'brĕd* [tr. of Heb. *lechem happanim,* bread of the face]: among the ancient Jews, twelve loaves of unleavened bread placed in two rows on a table in the holy place, and renewed every Sabbath. The bread was sprinkled with frankincense, which was burned each week, and the bread was then eaten by the priests within the sanctuary. The table of shew-bread was of acacia wood, overlaid with gold: see Lev. xxiv. 5-9.

SHEYTAN, n. *shā'tan* [Ar.]: Mohammedan name for the devil or a devil.

SHIAH, n. *shī'ă,* or SHEEAH, or SHIITE, n. *shī'īt:* sing. of SHIITES (q.v.): also see SUNNITES.

SHIBBOLETH, n. *shĭb'ō-lĕth* [Heb. *shibboleth,* an ear of corn, a flood]: test-word used by the Gileadites, under Jephthah, after their victory over the Ephraimites, recorded in Judges xii. 6. It appears that the latter could not pronounce the *sh,* and by saying *sibboleth,* betrayed themselves, and were slaughtered mercilessly. It may be noticed that all those Hebrew names in the Old Test. which begin with *sh,* have now, through the inability of the Septuagint to render this sound in Greek, become familiar to us through the versions that flowed from it, as beginning with the simple *s,* e.g., Sem, Simon, Samaria, Solomon, Saul, etc. The word Shibboleth is used to designate any watch-word or test of a sect or party.

SHIDE, n. *shīd* [Icel. *skid,* a thin piece of wood: Dut. *schieden,* to split wood: Ger. *scheit,* a splinter]: in *OE.,* a thin piece of wood; a splinter for burning.

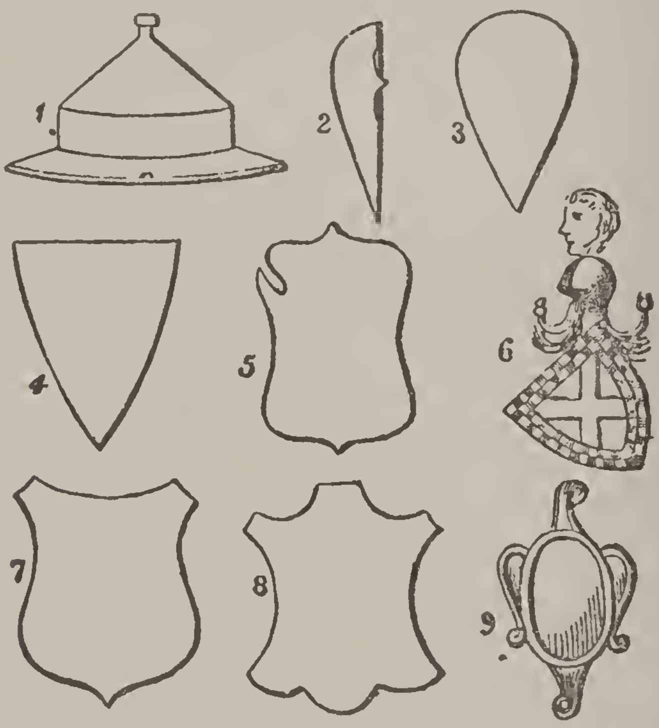
SHIED: see SHY. SHIES, *shīz,* third pers. sing. pres. of the v. SHY.

SHIEL, *shēl,* LOCH: lake in w. Scotland, part of the boundary between the counties of Argyle and Inverness, separating the district of Moidart on the n. from those of Sunart and Ardgower on the s. The head of the loch is about 16 m. w. of Fort-William. It is 15 m. long, about one m. broad, and communicates with the sea by Shiel Water and Loch Moidart.

SHIEL, n. *shēl,* or SHIEL'ING, n. [as if from *shield*]: a shelter: see SHEAL 2.

SHIELD, n. *shēld* [Ger. *schild;* Dan. *skiöld;* Icel. *skjöldr*, a shield; *skjol*, shelter, protection; *skyla*, to protect]: in *former times*, broad plate borne on the left arm as defensive armor in battle or single contest (see below): defense; shelter; one who defends or protects: in *bot.*, one of the little cups or disks containing the fructification of lichens: in *geol.*, a shell or covering: in *her.*, the escutcheon or field on which are blazoned the bearings in coats of arms: V. to cover as with a shield; to protect; to ward off; to defend SHIELD'ING, imp. SHIELD'ED, pp. SHIELD'LESS, a. *-lĕ* defenseless.

SHIELD: piece of defensive armor, borne on the left arm, to ward off the strokes of the sword, and missiles; constantly used from ancient times through the middle ages, till the invention of firearms rendered it useless. The large S. worn by the Greeks and Romans (Gr. *aspis*, Lat. *clipeus*) was circular, and often ornamented with devices. Another form (Lat. *scutum*) was used by the Roman heavy-armed infantry, square, but bent to encircle the body. The early S. or knightly escutcheon of the middle ages was circular in outline, and convex, with a boss in the centre; the body generally of wood, and the rim of metal (No. 1). In the 11th c., a form came into use which has been compared to a boy's kite (No. 2), and is said, with some probability, to have been brought by the Normans from Sicily. On shields of this shape armorial designs were first represented. These shields were in reality curved like the Roman *scutum;* but after heraldry began to be systematized, they were generally represented on seals, monuments etc., as flattened to let the whole armorial design be seen. In the 13th c., this long and tapering form began to give place to a pear-shape (No. 3), and a triangular or heater-shape (No. 4). During the 14th



Shields.

c., these new forms became generally prevalent, and the heater-shape, perhaps most frequent on armorial seals, began to approach more to an inverted equilateral arch. The same variety of forms, with some modifications, continued during the 15th c., a tendency appearing in all representations of the heater-shaped S. to give it more breadth below. A notch was often taken out in the dexter chief for reception of the lance, in which case the S. was said to be *à bouche* (No. 5). After the middle of the 14th c., when the S. came to be depicted as surmounted by the helmet and crest, the S. is often represented *couché*, that is, pendent from the corner (No. 6), an arrangement said to have originated in the practice of competitors hanging up their shields prior to a tournament, where, according to De la Colombière, if they were to fight on horse-back, they suspended it by the sinister chief, and if on foot, by the dexter chief. A square S. denoted a knight-banneret. Shields of arms were often represented as suspended from the *guige*, or shield-belt worn by knights to sustain the S. and secure it to their persons.

After the introduction of firearms made shields no longer a part of the warrior's actual equipment, the form of those on which armorial bearings were depicted, on seals, monuments, brasses, etc., varied greatly, and generally became gradually more tasteless, fanciful, and unmeaning (Nos. 7, 8, 9). A tendency has been shown in recent heraldry to recur to the artistic forms prevalent in the 14th and 15th c.—In early times, shields of the form which generally prevailed at the period were exhibited on the seals and monuments of ladies; but about the 15th c. the practice began, which afterward became usual, of unmarried ladies and widows (the sovereign excepted) bearing their arms on a lozenge instead of a S. The heraldic insignia of towns, corporations, etc., as well as individuals, are placed on shields. The bearing of Merchants' Marks (q.v.) in a S. was prohibited by the heralds of the 16th c. under severe penalties; yet not a few instances are found on monumental brasses of these devices placed on shields.

SHIELDS, *shēldz*, **Charles Woodruff**, D.D., LL.D.: theologian and author: b. New Albany, Ind., 1825, Apr. 4. He graduated at the Coll. of New Jersey 1844, and at the Princeton Theol. Seminary 1847. In 1849 he became pastor of the Presb. Church in Hempstead. Long Island, and in 1850 of the 2d Presb. Church of Philadelphia. In 1861 he published *Philosophia Ultima,* an exhaustive treatise on an educational plan for harmonizing science and religion. His treatise attracted much attention, and through it a new chair, of harmony of science and revealed religion, was created (1865) in Princeton Coll. The professorship was given to Dr. S., and he still (1903) holds it. Although since 1898 he has been a member of the Prot. Epis. church. Besides *Philosophia Ultima,* he has published *The Book of Common Prayer as Amended by the Presbyterian Divines of* 1661 (1864; 2d ed. 1883); *Liturgia Expurgata* (1864; 3d ed. 1884); *The Final Philosophy as Issuing from the Harmony of Science and Religion* (1877; 2d ed. 1879); and *Order of the Sciences* (1884).

SHIELDS, **James**: soldier: 1810–1879, June 1; b. Dungannon, County Tyrone, Ireland. He came to the U. S. 1826, studied law, was admitted to the bar, and began practice at Kaskaskia, Ill., 1832. He was elected to the legislature of that state 1836; state auditor 1839; judge of the supreme court 1843; and appointed commissioner of the U. S. land office 1845. At the beginning of the Mexican war, Pres. Polk commissioned him brig.gen. of vols., and he served throughout the war under Gens. Taylor, Wool, and Scott. He was badly wounded at Cerro Gordo, and again at Chapultepec. He was mustered out of service 1848 with the rank of brevet maj.gen. of vols., and was appointed gov. of Oregon Territory, but resigned on being elected U. S. senator for Ill. At the close of the term, 1855, he removed to Minn. When that territory became a state, 1858, he was elected U. S. senator, and at the expiration of his term, 1859, he removed to Cal. When the civil war began, he was again commissioned brig.gen. of vols., and on the death of Gen. Lander was given command of his brigade. 1862, Mar. 23, at the head of a division of Gen. Banks's army, he opened the second campaign by winning the battle at Winchester, though he had been wounded in a skirmish of the day before. 1863, Mar. 28, he resigned his commission, and soon afterward resumed the practice of law in Mo. In 1879 he was elected by the Mo. legislature U. S. senator to fill the vacancy caused by the death of Louis V. Bogy in 1877, David H. Armstrong having, by appointment of the gov., filled the position previously. He died at Ottumwa, Iowa.

SHIELDS, *shēldz*, North: seaport and market-town of Northumberland, England; in the parish of Tynemouth, on the n. bank of the Tyne, and at the mouth of that river, opposite South Shields; 8 m. e.n e. of Newcastle. It stretches more than a mile along the river-bank, and is rapidly extending w. to accommodate its rising trade and manufactures. There are numerous collieries in the vicinity, and the Northumberland Docks, within the borough, export more than a million tons of coal a year. The harbor is bordered with quays; and the quays of N. and S. Shields (which are, however, separate ports) are spacious enough to accommodate 2,000 vessels of 500 tons each. N. and S. Shields possess together more than 200,000 tons of shipping. Building of wood and iron vessels and tug-steamers, manufacture of anchors, chain-cables, ropes, blocks, masts, and other articles of ship-furniture, are principal industries. North S. has a free library, sailors' home, and theatre. The port of North S. is one of the three wards of the municipal and parliamentary borough of Tynemouth (q.v.). Pop. of North S. (1871) 8,619: Tynemouth (1871) 38,941; (1881) 44,118; (1891) 46,267.

SHIELDS, South: port, municipal and parliamentary borough, and market-town of Durham, England; on the s. bank of the Tyne, at the mouth of that river; 9 m. e.n.e. of Newcastle by river and railway. The town stretches two m. along Shields harbor, which is lined with numerous dock-yards and manufactories. The Tyne Dock, containing 50 acres of water space, in which more than a million tons of coals are annually shipped, and a large import-trade is carried on, is within the borough. The market-place is a spacious square in the centre of the town, near which is the large church of St. Hilda. The town, with N. Shields, is among the chief ports in the kingdom for building of iron ships, iron screw-steamers, and tug-steamers. There are large alkali, bottle, and glass works, and every kind of manufacture connected with shipping. A steam-ferry for passengers and carriages plies day and night between the two towns, one on the north and the other on the south side of the entrance to the Tyne. Shields bar has been removed by dredging, in order, with the piers, to form a harbor of refuge. The sea coast, in the neighborhood, is interesting from its rocks and caves. The life-boat is a South S. invention. South S. has a large public library, with news-room, and large hall for public meetings. There is an extensive colliery, that of St. Hilda's; a school board; and Tyne Pilotage Board. The Nautical College, founded on a bequest of £30,000, opened 1869, includes a museum and observatory. Pop. (1881) 56,922; (1891) 78,431; (1901) 97,267.

SHIFT, n. *shĭft* [Low Ger. *schuft;* Dut. *schoft*, the division of the day's work into four parts: Dan. *skifte*, to partition, shift, or change: Icel. *skipta*, to distribute: Sw. *skifta;* AS. *sciftan*, to divide]: a change; an expedient; something tried when another fails; last resource; in a bad sense, artifice; an evasion; a woman's under-garment; a chemise; the period during which a laborer works at a single stretch; hence, the change of workmen at the expiration of the proper time: V. to alter; to change; to change clothes; to transfer from one to another; to remove; to give place to other things; to alter in place, as a ship's cargo; to alter from one position to another; to resort to expedients for a livelihood, or to accomplish a purpose; to practice indirect methods. Shift'ing, imp.: N. the act of changing; the act of resorting to equivocal expedients. Shift'ed, pp. Shift'er, n. *-ėr*, one who shifts: one who assists the cook on board a vessel. Shift'y, a. *-ĭ*, given to change. Shift'iness, n. *-ĭ-nĕs*, the quality of being shifty or changeable. Shift'less, a. *-lĕs*, destitute of expedients to provide for one's self, or to use means requisite for success. Shift'lessly, ad. *-lĭ*. Shift'lessness, n. *-nĕs*, a state of being shiftless. Shift'ingly, ad. *-lĭ*. To shift about, to turn quite round; to vacillate. To shift off, to defer by some expedient. To make a shift, to contrive to make a thing serve one's purpose; to manage. A shift of linen, a change of linen. Night-shift, the division or party of workmen who labor during the night only, as opposed to Day-shift, the division of workmen who labor during the day.—Syn. of 'shift, n.': change; expedient; means; refuge; resource; fraud; artifice; stratagem; evasion; contrivance.

SHIITES, n. plu. *shī'īts* ('sectaries'), [from Ar. *shiah*, *shiat*, party, faction; *shĭ'ai*, follower of Ali—from *shá'a*, to follow]: name given to a Mohammedan sect by the 'Sunnites' (q.v.) or orthodox Moslems. The S. call themselves 'followers of Ali,' and have special observances, ceremonies, and rites, as well as particular dogmas of their own. The principal difference between the two consists in the belief of the S. that the Imamat, or supreme rule both spiritual and secular over all Mohammedans, was originally vested in Ali Ibn Abi Taleb, and has been inherited by his descendants, to whom it legitimately now belongs. Also, they reject the Sunna or body of traditions respecting Mohammed from being any part of the law. The Persians are S.; the Turks, on the other hand, are Sunnites; and this division between the two nations dates chiefly from the caliphate of Mothi Lilla, the Abasside, H. 363 (about A.D. 974), when political dissensions, which ended in the destruction of Bagdad and the loss of the caliphate of the Moslems, assumed the character of a religious war. The S. themselves never assume that (derogatory) name, but call themselves *Al-Adeliat*, 'Sect of the Just Ones.' They are subdivided again into five sects, to one of which, that of Haidar, the Persians belong: the present dynasty of Persia deriving its descent from Haidar, descendant of Ali. Ali himself is, by some of them, endowed with superhuman attributes.—The S. believe in metempsychosis and the descent of God upon His creatures, inasmuch as He, omnipresent, sometimes appears in some individual person, such as their Imams. Their five sub-divisions they liken unto five trees, with 70 branches; for their minor divisions of opinions, on comparatively unimportant points of dogma, are endless. Yet in this they all agree, that they consider the caliphs Abu Bekr, Omar, and Othman, who are regarded with the highest reverence by the orthodox Sunnites, as unrighteous pretenders, and usurpers of the sovereign power, which properly ought to have gone to Ali direct from the Prophet. For the same reason, they abominate the memory of the Ommayad caliphs, who put to death Husain, son of Ali, and they still mourn his death at its anniversary. They reject likewise the Abasside caliphs, notwithstanding their descent from Mohammed, because they did not belong to Ali's line.—Other forms of the name are *Schiïtes, Shiyaites.*

SHIKAR, n. *shĭ-kâr'* [Pers.]: in *India*, hunting; sport requiring firearms. **SHIKAREE**, n. *shĭ-kâr'ē*, a native sportsman; a sportsman: spelled also **SHIKARREE**.

SHIKARPUR, *shĭk-ėr-pôr':* most important trading-town, and probably most populous town, in Sinde; about 20 m. w. of the Indus, half way between Multan and Kûrrachi. The district in which it stands is so low and level that, by means of canals, which are supplied from the Indus, it is flooded every season. Its climate, notwithstanding, is said to be healthful. The inundated quarters are extremely fertile and produce great crops. Groves, orchards, and fruit-gardens surround the town; sugar-cane is largely grown S. is on one of the great routes by the Bolan Pass from Sinde to Afghanistan, and the transit-trade to that country and to Khorassan is important. The bankers and financiers of S. are known and trusted from Astrakhan to Calcutta. S. is the chief town of the dist. of S., which has 10,001 sq. m., 852,986 inhabitants.—Pop. of town (1881) 42,496, more than 20,000 of whom were Hindus, the rest chiefly Mohammedans; (1891) 42,400.

SHIL'KA: see AMOOR.

SHILLABER, *shĭl'a-bėr*, **BENJAMIN PENHALLOW**: humorist· 1814, July 12—1890, Nov. 25: b. Portsmouth, N. H He was educated at the public schools and at Phillips Exeter Acad ; at the age of 16 entered a printing-office in Dover, N. H. Two years later he removed to Boston, where he was employed in a printing-office until 1837, when he went to Demerara, British Guiana. Returning to Boston 1840, he became assistant editor of the *Post*, a position he retained for 10 years. In 1847 he published the first Mrs. Partington's saying, 'a three-line paragraph, which, I think, I "set up" without writing.' This was widely copied by the newspapers. In 1852 S left the *Post*, and in connection with Charles G. Halpine (Miles O'Reilly) started a humorous paper, the *Carpet-Bag;* but it was not successful and he returned to the *Post*, remaining until 1856, when he became one of the editors of the *Saturday Evening*

Gazette. In 1866 he retired from active life to his home in Chelsea, Mass. Besides the famous *Life and Sayings of Mrs. Partington* (1854), he published *Rhymes with Reason and without* (1853); *Knitting-Work* (1857); *Partingtonian Patchwork* (1873); *Lines in Pleasant Places* (1875); *Ike and His Friends* (1879); *Cruises with Captain Bob* (1881); *The Doublerunner Club* (1882); and *Wide Swath*, a collection of verses (1884). During his editorial life and for several years afterward he was a constant contributor to papers and periodicals. He died at Chelsea.

SHILLALAH, n. *shĭl-lă'lă*, or Shilla'ly, n. *-lĭ*, or Shille'lah, n. *-lē'lă* [from *Shillelagh*, a barony of county Wicklow, noted for its oak-forests]: among the *Irish*, a cudgel; a stout stick.

SHILLING, n. *shĭl'lĭng* [Dan. and Sw. *skilling;* Ger. *schilling*, a piece of money; AS. *scylling:* Sw. *skilja*, to divide]: English silver coin whose name is apparently from a root *skil*, to divide, either because it was a small slice of metal, or was deeply marked with an indented cross, so as to be easily broken in four. The old English coin was worth 4*d.* or 5*d.;* but after the Norman Conquest the French representative of the Roman Solidus (q.v.) was called a shilling. The S. in the present sense seems to have been coined first by Henry VII 1504; milled shillings were coined first by Charles II. 1662. The silver S. is nominally worth the 20th part of a pound sterling. But the silver of which shillings are made contains 11 oz. 2 dwts. pure silver and 18 dwts. alloy; and 1 lb. by weight of this compound is coined into 66 shillings; so that each shilling contains 80·727 grains fine silver, and its value as bullion is much less than its nominal value. The shillings in the old coinages of various n. European countries have usually a much smaller value; the Danish copper *skilling* only ¼*d.*, and the silver *schilling* of Hamburg less than 1*d.* The present Eng. S. is worth in U. S. money about 24½ cents.—See Pound: Mint.

SHILLY-SHALLY, n. *shĭl'lĭ-shăl'lĭ* [a corruption of the reduplication *shall I, shall I*]: foolish trifling; irresolution: Ad. in an irresolute or undecided manner: V. to act in an undecided manner; to hesitate. Shil'ly-shal'lying, n. foolish trifling; irresolution: Adj. foolishly trifling; irresolute.

SHILOH, n. *shī'lō* [Heb. *shiloh*, quiet, rest—from *shalah*, to rest]: town of anc Palestine, division of Ephraim. It is identified with the comparatively modern village of Seilun, about 20 m. n. of Jerusalem, on the road from Bethel to Shechem. The position of the hills around it gives strength to the supposition that it was a fortress as well as a consecrated place. It was here that the ark of the covenant remained during the priesthood of Eli, and the annual 'feast of the Lord' was held. It was at one of these annual festivals that the defeated Benjamites, lying in ambush in the vineyards, seized the 'daughters of Shiloh' while dancing, and carried them to their homes in the land of Benjamin for wives.

The country around S. is not attractive, but the soil is fertile, and there are evidences that the entire vicinity was once under thorough cultivation. After the carrying away of the ark by the Philistines, and the death of Eli, S. sank into obscurity.

The word *Shiloh* in Gen. xlix. 10, in the patriarch Jacob's dying vision of the tribes of Israel—an impressive dream-like prophecy of their future and of the Messiah who was to come forth from them in some coming time—has had various interpretations (see Smith's *Bible Dictionary*). Of those interpretations which refer the word to a *place*, one much favored is that *Shiloh* is the name of the city in Ephraim where the ark of the covenant remained during a long period; and the reading would be, 'Nor the ruler's staff from between his feet, till he shall go to Shiloh.' A modification of this makes *Shiloh* (which is from a root meaning *peace, rest*) mean the place or city of rest to which the promised Ruler, the Messiah, shall come, bringing his people, the Israel of God.—Of the interpretations which refer the word Shiloh to a *person*, viz., the Messiah, noticeable is that which gives it here the meaning Prince of Peace or Author of Tranquillity—'until Messiah, the Prince of Peace, shall come.'—With whatever natural interpretation, the Messianic reference of the word, and of the prophecy in which it occurs, seems undeniable.

SHILOH, BATTLE OF (known also as the BATTLE OF PITTSBURGH LANDING): 1862, Apr. 6, 7, at Shiloh, Hardin co., Tenn., 2 m. w. of Pittsburgh Landing, on the Tennessee river; between the Union troops under Gen. Grant and the Confederates under Gens. A. S. Johnston and Beauregard. It was the first engagement of consequence in the west after the fall of Nashville and the capture of Forts Henry and Donelson. Gen. Grant, pushing up the river, endeavored to cut off the communications of the Confederates, then at Corinth, in w. Tenn.; and ordered Gen. Buell to march from Nashville and join him at Pittsburgh Landing. Grant arrived with 32,000 men Apr. 1. Johnston, aware of Grant's design, moved hurriedly from Corinth with 45,000 men, expecting to attack Grant before Buell arrived. On the morning of the 6th, while Grant was eagerly awaiting Buell's appearance, Johnston attacked him and forced his army to fall back nearly to the landing. In the afternoon Buell arrived on the opposite side of the river, threw one div. across, and immediately went into action. Soon afterward Johnston was mortally wounded, and Beauregard, succeeding to the command, threw his army against the centre and left wing of the Union troops. The assault was repulsed, and at nightfall the gunboats supporting Grant bombarded the Confederate position, causing some retreating. During the night Buell threw the remainder of his army across the river, giving Grant a force about equal to the Confederates; and at daybreak Grant reopened the battle with a heavy artillery-fire, followed it with a general assault, which was resisted till the middle of the afternoon, recaptured his lines and cannon lost the previous day, and before darkness drove the Confederates to hasty retreat. The

Union loss was reported at 1,700 killed, 7,495 wounded, and 3,022 prisoners; and the Confederate at 1,728 killed, 8,012 wounded, and 959 missing. See Corinth: Donelson, Fort: Nashville, Battle of.

SHILY: same as Shyly.

SHIMMER, v. *shĭm'ėr* [Ger. *schimmern;* Sw. *skimra,* to glimmer, to flicker: OHG. *sciman,* to shine; *scimo,* a bright light]: to shine unsteadily or obscurely; to glimmer; to flicker: N. a faint sparkle or glimmering. Shim'mering, imp. Shim'mered, pp. *-ėrd.*

SHIN, n. *shĭn* [Dut. *scheen;* Sw. *sken-ben,* the shin-bone: Ger. *schiene,* a splint, the tire of a wheel: AS. *scina,* the shin]: the forepart of the leg, or the bone of the forepart of the leg. Shin-bone, bone of the shin; the tibia.

SHIN, Loch: lake in s. Sutherlandshire, Scotland, 18 m. long, 1 m. wide. The Shin Water, famous trout-stream, carries the waters of the loch into Oikell Water. Loch S. abounds in trout and salmon.

SHINDY, n. *shĭn'dĭ:* in *slang,* a domestic disturbance; a row generally.

SHINE, v. *shīn* [Goth. *skeinan;* Icel. *skina;* Dan. *skinne;* Ger. *scheinen,* to shine: AS. *scinan,* to shine]: to give light; to exhibit brightness or splendor; to be glossy; to gleam; to glow; to beam with a steady light: to be eminent or distinguished; in *Scrip.,* to manifest glorious excellences; to be manifest; to be propitious: N. fair weather; light; brightness; splendor. Shin'ing, imp.: Adj. bright; splendid; distinguished; in *bot.,* applied to a smooth and polished surface: N. clearness of light; brightness. Shined, pp. *shīnd.* Shone, pt. and pp. *shōn* or *shŏn,* did shine. Shiny, a. *shīn'ĭ,* bright; luminous; unclouded; glossy. To take the shine out of, to surpass. To make a shine, to make a display.—Syn. of 'shining, a.': bright; radiant; resplendent; lustrous; illustrious; glistening; effulgent; brilliant; glittering; splendid.

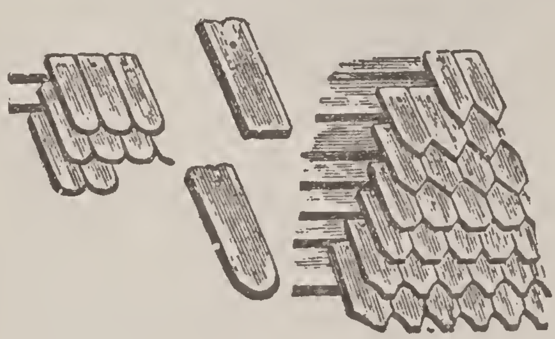
SHINE, n. *shīn:* in *slang,* quarrel; disturbance.

SHINER: name applied mostly to some small fish of the Carp family (*Cyprinidæ*). The Golden S. is similar to the European Bream, and sometimes reaches 1 ft. in length.—The S. known also as Red fin, or Red Dace (*Minnilus cornutus*), is a common boy's-fish.—The Menhaden in Fla., and a Pacific-coast Surf-fish, are there called S.—The Blunt-nosed or Pug-nosed S., of family *Carangidæ,* is the Moon-fish of the south and the Hump-backed Butter-fish of Wood's Holl, Mass.

SHING-KING, or LEAOTONG: see MANCHURIA.

SHINGLE, n. *shĭng'gl* [Norw. *singla*, to jingle, to clink; *singl*, gravel, shingle]: the pebbles on the sea-shore, so named from the jingling noise made by them from the movements of the waves on the beach: in *geol.*, loose angular fragments of stone—*gravel* being rounded fragments.

SHINGLE, n. *shĭng'gl*, SHIN'GLES, n. plu. *-glz* [Ger. *schindel*, a splint for a broken arm, a shingle: L. *scin'dŭla* or *scan'dŭla*, a shingle—from *scando*, I climb—so called from shingles resting on a roof like steps, one above the other]: thin slab or flat piece of wood used in roofing instead of tile or slate: the wood is chosen from the kinds that split readily and straightly; it is cut into blocks whose longitudinal faces are of the size intended for the shingles, which then are regularly split off in thicknesses of about a quarter of an inch. SHINGLE, v. to cover with shingles.



Shingles.

SHIN'GLING, imp. *-glĭng:* N. act of covering with shingles; a covering of shingles. SHIN'GLED, pp. *-gld:* ADJ. covered with shingles. SHINGLING-HAMMER, a ponderous hammer, moved by machinery, for hammering and shaping masses of iron while red-hot into oblong or square pieces. SHINGLING-MILL, a great workshop where cast or pig iron is changed into malleable iron.

SHINGLES, n. plu. *shĭng'glz* [OF. *sangle*, *cengle*, a girth—from L. *cingŭlum*, a girdle—from *cingĕrĕ*, to surround]: popular name for the variety of *Herpes* known as *H. zoster;* eruptive disease, usually spreading round the body like a girdle; called also *tetter:* see HERPES.

SHINTOISM: see JAPAN—*Religions.*

SHIN'TOIST, n.: a believer in Shinto.

SHINTY, n. *shĭn'tĭ* [Ir. *shon*, a club: Gael. SINTE, *sèn'-chĕ*, stretched, reached, applied to the ball reaching the goal]: in *Scot.*, an outdoor game, in which a ball and clubs with crooked heads are employed, the object of each party being to drive the ball over their opponents' *hail* or boundary—the English game *hockey;* the club used in playing the game.

SHINY: see under Shine 1.

SHIP, n. *shĭp* [Goth. *skip;* Ger. *schiff;* Dan. *skib;* F. *esquif;* It. *schifo,* a ship or boat: L. *scapha;* Gr. *skaphē,* any hollow vessel, a boat—from Gr. *skaptein,* to dig, to scoop out]: generally, any large vessel for conveying goods and passengers over the sea, or on a large lake or river—

The Ship *Northfleet.*

the term being applied with great vagueness to any large vessel: in a special sense, a vessel with a bowsprit, and with three masts, each surmounted by a royal mast; but the development of steam navigation in which the largest vessels have sometimes only a schooner-rig, has tended to obliterate the special distinction: V. to put on board a ship; to convey by water; to receive into the ship, as to *ship* a heavy sea; to engage for service in a ship; to fix in its place, as to *ship* the tiller. Ship'ping, imp.: N. ships or vessels collectively, of all sizes, but excluding boats without decks: tonnage. Shipped, pp. *shĭpt,* put on board a ship, as goods. Ship'per, n. *-pėr,* one who puts goods on board a ship to be conveyed to a distant place. Ship'ment, n. *-mĕnt,* the act of putting anything on board a ship for conveyance by sea; the goods shipped. Ship'ful, n. *-fûl,* enough to fill a ship. Ship-like, a. like a ship. Ship'less, a. *-lĕs,* without a ship. Ship-biscuit, hard coarse biscuit prepared for long keeping, and for use on board a ship. Shipboard, aboard or in a ship. Ship-breaker, one whose business is to break up vessels that are unfit for sea. Ship-broker, one who transacts business connected with ships, as insurances, sales, etc. (see below). Ship-builder, one who constructs ships. Ship-building, art of constructing ships (see below). Ship-canal, canal connecting two seas, two navigable rivers, or two large pieces of water, and through which vessels of large burden can pass (see Interoceanic Ship Canal). Ship-carpenter, a carpenter who works at the building of ships. Ship-chandler, one who supplies ships with cordage, canvas, etc. Ship-holder, or Ship-owner, a proprietor of a ship or ships. Ship's husband, one who looks after and provides stores, provisions, etc., for a ship (see below). Ship-load, the load or cargo of a ship. Ship-master, the captain or commander of a ship. SHIPMATE, a fellow-sailor. SHIP-OWNER: see SHIP-HOLDER. SHIP-SHAPE, in a seamanlike manner; neat; trim; well put; properly. SHIP-WORM (see TEREDO). SHIPWRECK, n. loss or destruction of a ship at sea by foundering, striking on rocks or shoals, collision, or by other means (see below): destruction; miscarriage: V. to destroy, as a ship; to throw into or be in distress or difficulty, as by shipwreck. SHIPWRECKED, a. cast ashore on rocks or banks; destroyed. SHIP-WRIGHT, a ship-carpenter. SHIP-YARD, a place adjoining the sea where ships are built and repaired. A SHIP OF THE LINE, one of the large vessels of war of sufficient size and armament to take its place in line of battle. SHIPPING ARTICLES, articles of agreement between the captain and his seamen. SHIP'S PAPERS, certain documents with which every sea-going vessel must be furnished, such as the register, the charter-party, bills of lading, log-book, bill of health, etc. To SHIP A SEA, to have a large quantity of sea-water thrown on board, as in a storm. To SHIP OFF, to send away by water in a ship.

SHIP-BROKER: person employed in buying and selling and freighting of ships. His duties include adjusting the terms of charter-parties and bills of lading, settling with the master for his salary, collecting freights on goods brought into port, arranging with passengers for the terms of their passage, and generally managing all business transactions between ship-owners and the shippers or consignees of goods. A. S.-B., like other brokers, receives a commission from the seller only.

The business of an *insurance-broker* is usually combined with that of a ship-broker. In the United States, marine insurance is effected after the same manner as the insurance of other property—i.e., by the payment of a premium to an insurance company (or companies) or their agents. A very different system prevails in Britain. There the underwriters are in most cases not companies, but individual capitalists, known to the broker as persons prepared to undergo any risks which he recommends to them. The broker, who has a list of persons ready at a moment's notice to underwrite a policy, is the mutual agent for both parties. He procures the subscriptions of the underwriters, arranging with them the rate of premium and conditions of the risk; receiving from them the amount of their respective subscriptions, in the event of loss; and, when such loss is partial, arranging the proportion to be recovered from the different underwriters. An insurance-broker charges as commission five per cent. on the premium, and one-half per cent. deducted from all claims recovered from the underwriters. He is personally liable to the underwriters for the amount of the premium, but incurs no liability to make good the amount insured to the owner of the ship and goods, who, in case of loss, must look to the underwriter alone for indemnification.

SHIP-BUILDING: art of constructing vessels, especially large vessels, for navigation. See NAVIES, ANCIENT AND MEDIÆVAL: NAVIES, MODERN: BRITISH NAVY: UNITED STATES NAVY: NAVIGATION, HISTORY OF: NAVIGATION LAWS: ARMOR-PLATES: SHIPPING: ETC. From crossing a river or lake on a floating log, or on two or more logs fastened together raft-wise, the first step toward S.-B. was probably the scooping out a Canoe (q.v.) from a tree-trunk. The earliest Egyptian drawings show boats constructed of sawn planks, with sails as well as numerous oars. So far as can be learned from ancient sculptures, the galleys of the Mediterranean at the dawn of civilization were open, at least in the middle portion; were built with keel, ribs, and planking; and were strengthened crosswise by the numerous benches on which the rowers sat. Ships long continued to be generally of light draught, for they were beached every winter; and Cæsar mentions, as a noteworthy circumstance, that some of the long ships with which he invaded Britain could approach the shore only to such a point that the soldiers disembarking were breast-high in the water. The Romans built their vessels of pine, cedar, and other light woods; but their ships of war were of oak at the bows, clamped strongly with iron or brass, for use as rams—a custom now revived after 2,000 years of disuse. According to Cæsar, the Veneti were the first to build entirely of oak. The speedy oxidation of iron bolts and fastenings led to the use of copper and brass about the time of Nero. Before this time, the planks had been calked with flax, and the seams had been pitched. There is evidence to show that in Trajan's reign sheathing of lead fastened on with copper nails was used to protect the timbers from the devastating borers of the Mediterranean. With Rome's decline arose a new era for S.-B. The hardy Norsemen had to contend with chopping seas and Atlantic swells; their ships differed much from the stately galleys of the empire. A viking war ship unearthed 1880 from a sepulchral mound at Sandefjord in Norway, and now preserved at Christiania, is 78 ft. long, 7 wide amidships, and 5¾ deep, drawing less than 4 ft of water. She was clinker-built; and had 32 oars, each 20 ft. long, and but one mast 40 ft. high, which probably carried a single square sail. The rudder was on the starboard side; it was like a long-bladed, short-handled oar, and was attached to a conical piece of wood, projecting a foot from the side of the vessel, and nearly two ft. from the stern. She was not one of their largest war-ships; for some had 60, several from 40 to 50 oars; but she is the largest yet discovered. The introduction by Alfred of galleys pulled by 40 to 60 oars, kept the viking war-ships in check; but it checked also the development of ocean-navigation, for the galleys were fit only for shore-service. The ships gradually increased in size. Hardicanute had a galley pulled by 80 oars; and contemporaneously the Venetians built ships of 1,200 to 2,000 tons. William invaded England in diminutive sailing-vessels; but large—indeed very large—vessels appear to have been built in the time of Richard I. John systematized S.-B. by establishing a royal dockyard at Portsmouth. Large ships constructed for sailing seem to have come into general use, together with the mariner's compass, in the beginning of the 14th c.; and 150 years later the addition of the bowsprit added much to the sailing power of vessels.

In Ellis's Collection of Letters there is one, dated 1419, from John Alcêtre to King Henry V., concerning a ship building at Bayonne for that monarch. This letter is curious, as showing how many of the present terms then existed, also that the 'Kynges schyppes' were of considerable dimensions (e.g., 'the stemme is in hithe 96 fete; and the post 48 fete, and the kele ys yn leynthe 112 fete'). Before this period, ships had been built strong enough to encounter ice in the whale-fishery. From this period the history of S.-B. is resolved into the history of individual parts, for the main principles of wooden ships were already established. In Henry VII.'s reign, the cumbrous fourth mast began to be dispensed with; in that of his successors, shifting top-masts came into fashion, and the lofty stems and sterns (which must have precluded sailing on a wind) fell gradually into disuse. Port-holes were invented at least as early as 1500. In 1567, there were cutter-rigged vessels in the British seas. In the century ensuing, naval architecture was much improved by Phineas Pett, his son Peter, and Sir Anthony Deane; but the best naval architects were not in England. Within the 19th c. the introduction of steam has led to building ships with finer lines, for both bow and stern. About 1836, iron was introduced as material for ships, and after having largely superseded wood, is now giving place to steel.

As now practiced, ship-building is divided into Naval Architecture or Design, and Naval Construction—including equipment and launching

Naval Architecture.—Naval architecture treats of the methods of making a vessel float, carry heavy weights, keep a vertical keel against the action of wind and wave, steer readily, cut the water easily, and maintain one exact draught of water when light and another draught when loaded; and of the qualities which cause her to preserve her keel vertical both when light and when loaded, and to recoil from a heavy wave on one side without permitting one to enter on the other. Its plans include causing her bow to rise just enough to prevent the waves rolling over her, without causing a shock in settling, or retarding her advance; giving the stern such form as to prevent the sea from breaking over her poop; giving sufficient resistance to prevent her being upset, but without risk of snapping her masts. It aims to enable her to be turned in short time and space at any speed; to make her weatherly, and fast before, against, or across the wind, with any load, and in either smooth or rough water.

Ship-building aims to give the materials such shapes, sizes, strengths, and movements as to embody the naval architect's calculations, with durability and at as low a cost as practicable.

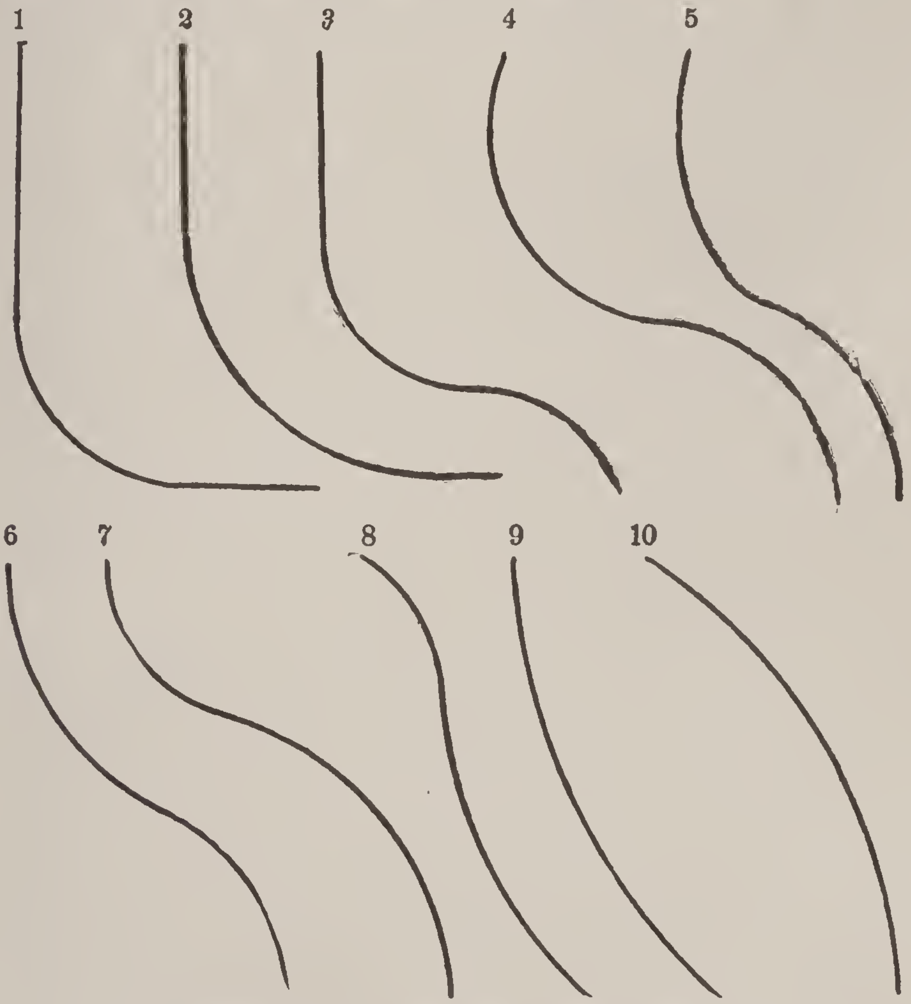
Ship-building provides for making the hull tight and stanch, with such weight as shall cause the vessel when unloaded, to sink just to the desired line; for giving strength to carry the heaviest load without straining; for properly distributing weights; and for shaping all parts from the drawings, so that they may go together perfectly and be joined properly. Building includes putting in, besides the rudder and steering devices, the anchors, cables, boats and other tackle, masts, yards, and pumps; and it provides for the vessel's capability for being launched.

The constructor calculates the weights (1) when light; (2) including all essential and practically permanent parts—not counting stores that are to be consumed, nor cargo. Then he must reckon (3) the vessel's weight when given her maximum load. The constructor must see that the vessel draws the same forward and aft, or else is trimmed by the head or by the stern, in which case she draws more either at the bow or at the stern, respectively. The expression 'mean draught' refers to the average between the head and stern draughts, and is of use only in calculating the displacement; the depth of water required to float the vessel depends on extreme draught.

The architect having decided on the form of hull, and marked where he desires it to sink when light, then computes the volume of the immersed part. This limits the weight available for construction and permanent equipment, for this weight will be exactly that of the water filling that volume; rather more in sea-water than in fresh. He computes the volume between the light and the load draught-lines; and the weight of an equal volume of water represents the weight that may be put in to sink the vessel just to the load-line. Buoyancy is given first by bulk; and as the pressure per sq. ft. on a hull is greatest at the bottom, other things being equal, a deep ship will have greater buoyancy than a shallow one; also, other things being equal, one of great area of bottom will have greater floating power than one of small. An American river steamboat has great floating power, notwithstanding her extreme shallowness and the height above water of the principal weights—by reason of the great bottom area. Top-heaviness could be counteracted by low ballast; but that would lessen the cargo-carrying capacity for a given displacement, or cause greater displacement for a given useful weight. It is better to give uprightness by proper curve, proportion, and angle of the 'shoulder'—that part of the hull a little each side of the water-line when the vessel is perfectly upright at medium draught. While the under-water body gives floating power, or power to carry cargo, it tends to upset the vessel.

There is one axis about which the weight of the vessel may be considered as concentrated, and care must be taken that this centre of gravity does not come above the 'metacentre' or limiting point of top-weight. When a vessel rolls or careens, the top-weight and the upward pressure of the water act in direction oppositely, but in tendency together—tending to upset the boat.

The wings or wedge-like volumes from the centre of width, and having the shoulders as bases, help the vessel to rise when rolling: they must be of such size and shape as to counteract the upsetting tendency of the top-weight and that of the water-pressure on the under-water body. A vessel that has not enough shoulder to overcome these two upsetting tendencies is 'cranky.' Ship-builders formerly believed that a shallow vessel was of necessity cranky; but our river vessels are much steadier than the average deep-water hulls of olden times, and are much less cranky when their centres of gravity are high than when by reason of heavy loads they are low; while a floating dock is very shallow and not at all cranky, and is much less cranky when light than when bearing a vessel.



Midship Sections, Sterns, and Bows.

Crankiness may be cured by giving more shoulder, or by lengthening the hull, so as to lighten the draught. Other things being equal, the greater the width, the greater the stability with constant breadth. Decrease of displacement increases stability. With constant breadth and displacement, the greater the draught, the lower the centre of displacement and the meta-centre. Formerly, ballast, or non-paying or non-working weight, was carried low down, to lower the centre of gravity: now, the engines, coal, etc., are kept well down, for the same purpose. Stowing the cargo low increases stability. The greater the size of bottom, the less stability. Other things being equal, the wider the shoulder, the more stable the vessel; but where she has to enter a narrow dock, or for other reasons must be narrow, stability must be given by form rather than by breadth of shoulder.

Figures 1 to 6 inclusive represent half-midship sections, of greatly varying character. In each the light draught is supposed to come about one-third from the bottom; the load-draught line about two-thirds. Their stability increases in about the order in which they are numbered. Ability to carry cargo might seem directly opposite to stability; but this need not be so, for a vessel must taper at bow and stern, and the vertical section can be so varied from the greatest cross-section to the bow and stern as to give these two latter portions stability both for themselves and for the cargo-carrying midship portion. Thus, e.g., the vertical cross-section may change from the form in fig. 5, or in other of these sections, to fig. 6, and then to fig. 7.

Figures 5, 6, and 7 are more stable at deep draught than at light. In fig. 5 the stabilities at light and heavy loads are as 3 to 7; in fig. 6 the stability at deepest load is about double that at middle draught; in fig. 7 there is stability only at deepest: it follows that fig 5 is the most stable stern cross-section. Those who consider a fine run necessary are right only in measure. At the bottom the stern should have a fine run, which is of use there and is needed there; but at the surface of the water it neither gives buoyancy nor increases speed. The volume given the stern under this principle may be taken from the bow, where small cross-section gives speed. In screw-propelled vessels the full-shouldered and fine-heeled stern is best, giving the screw full scope.

In the bow, there are, in addition to buoyancy, three principal things to be considered—fineness of entrance (if desired for speed), dryness, and easy riding. Bluff bows were formerly considered easy riding, and so they were for small vessels; but modern practice shows the 'straight' and 'wave' bows to be driest and safest. This is often shown in cyclones. While a full bow causes a vessel to rise on one wave, it lets her come down with a shock that strains the framing and causes discomfort to passengers and crew. A bluff bow is not conducive to speed. It is the proper work of the bow to cleave the waves, part them, and pass them by with little disturbance; not to ride them. Making the over-water bow fuller than the under-water prevents taking in a sea; but this should not be carried to excess; as far as possible the parts should have equal fulness, making the bow, between wind and water, nearly straight and nearly vertical. The *Great Eastern* had a bow with over-water and under-water parts so proportioned as to make her ride well in all weathers.

The bell bow, shown exaggerated in fig. 8, was formerly a favorite; but while it rode easily, it retarded speed. The clipper bow was another far-out bow; being belled laterally and drawn out lengthwise into a fine point; the bulwarks being carried out far in front of the actual vessel. While this was good in turning away spray, the leverage that such an overhanging mass gave green water when shipped was dangerous. The tumble-home bow has its full projection on the water-line, while above that the sides turn inward; it gives the greatest dryness and speed in bad weather, with ease and safety. The English blockade-runners of our civil war had this. The flaring-out bow is all right for river and fine-weather work, but wrong for ocean and bad-weather service. All these remarks apply to large vessels only; a small vessel must have fulness above the water-line at the bow to prevent swamping.

To make a vessel rise slowly and fall gently, it is necessary to find its lengthwise meta-centre. There is a wedge at the bow, and one at the stern, the bases of which are measured by the difference in height between the immersion-lines when rising and when falling. The nearer the vessel's centre of gravity the centres of effort of these wedges are, the less lifting power the waves have; therefore it is better to have the bow fine forward and fuller somewhat aft, than full forward and not further aft. After stiffness, weatherliness must be sought for, and leewardliness avoided. The vessel must go in the direction intended, making headway across or against the wind instead of driving broadside. The greater the lengthwise vertical section of the hull (other things being equal), the more weatherly will she be. She must be long in proportion to the width; but another and most important thing should be considered—the shape of the bow; for some vessels have such bows as to make it difficult to drive them ahead, and easy for them to be driven to leeward.

As in a fresh breeze a vessel can carry an area of sail of about six times her lengthwise immersed vertical cross-section, this must be considered in calculating the weatherliness. To make the vessel weatherly, she may (1) be given small cross-section; (2) have her shape fine, so that she will drive ahead more easily; (3) be made long; or (4) be made deep; or any combination of these four things—circumstances permitting. For shallow waters, great depth may not be permitted; but if there is depth, there may be a deep keel or false keel, or dead-wood in the stern and in the cut-water, and even in the run, before the rudder. Some of our modern yachts are nearly all dead-wood and keel, having no carrying capacity. Where none of these plans may be employed, the Hollandish leeboards may be called into play. These are great flat boards, so let down on the leeside as to interpose their area to leeward drifting. Our American centreboard helps as another resort.

Handiness is given by balance of sail and of vessel, and proportion of rudder. With too much sail forward, the vessel will drive head first; with too much at the stern, she will go to leeward. If the bow be so trimmed as to make it go more readily to leeward than the stern, the head will go around to leeward.

A vessel, to turn quickly, should have depth rather than length; and there should be as little lengthwise area near the ends, and as much in the middle, as possible. The cut-water too far aft makes a vessel slow to come around. Dead-wood is best put aft.

The longer the hull, the broader the rudder must be. For an unbalanced rudder the rule is that the width should be 2 per cent. of the vessel's length, plus one ft. If the rudder is widest near load water-line, a heavy sea may injure it. While if widest at the heel it will be less liable to be injured, in a wooden screw-vessel it will have more tendency to injure the weakest part of the hull. It is best to have it widest near its centre of length.

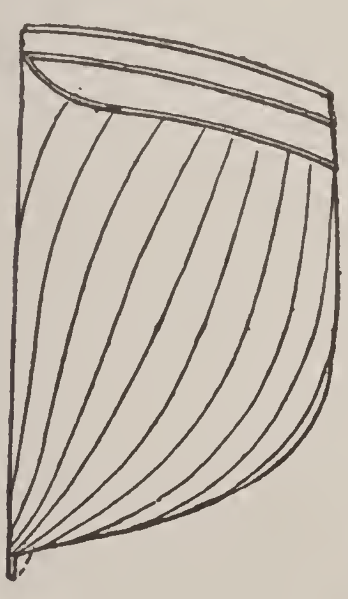
A vessel that has a disposition to fall off is said to be leewardly; one that has a tendency to fly to is said to be ardent: of the two, the latter is best. In the first case she must be given lee, or slack helm; in the second, weather-helm. If the lines of the vessel are not right, it will be necessary, to give balance of body, to put the sails forward of the centre of proper resistance, sometimes as much as 10 or 12 ft. For slight trouble in this particular, the masts may be raked one way or the other, or a little dead-wood may be put on at whichever end is necessary, or there may be a tapering false keel. If this fail, the masts must be shifted. In the 'wave-line' system of design, the centres of effort of sail and of body resistance always coincide. A vessel with long, straight middle body will tend to fly to, no matter what her lines, fore and aft of this straight middle section.

Keeling causes a vessel to fly to, by changing the shape of the water-line owing to a full part of the hull coming into the water and getting excess of pressure at that point, and by bringing the centre of effort of the sails to leeward, while the masts have a horizontal leverage tending to throw the vessel's head into the wind. Fore and aft sails tend to make a vessel ardent, because their centre of effort is always to leeward; this being so to much greater degree than with square sails, despite their bellying. Skin-friction makes a vessel ardent, there being an increased volume or layer of water that gathers along the hull.

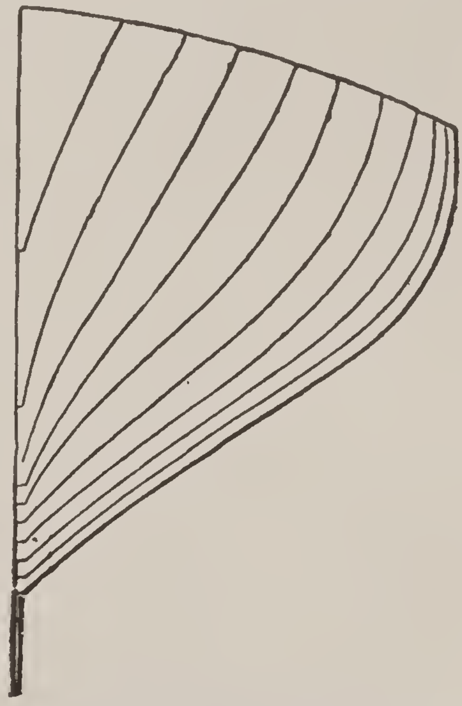
For ordinary sailing vessels not built on the wave-line plan, the centre of resistance of the sails should be slightly forward of the middle of the vessel, and the centre of hull resistance slightly aft; say one-twentieth the ship's length between these two centres. Most vessels shift their centre of lateral resistance forward as their speed increases, thus calling for sail to be diminished as the wind rises. Trimming the vessel by the stern moves the centre of resistance aft; so do raking the stern-post and rounding the stem.

The first work of the naval architect is to lay down a midship section which will give sufficient flotation, with good sea-going qualities. Next, he must determine the water-line. If he seek speed, he will choose that water-line which has been shown best for speed, the length determining that; but he may have to sacrifice speed to capacity. Next, he will arrange the size and form of the main-deck, and then lay down a general skeleton design from which to calculate displacements, etc. In midship section there is the range from fig. 3, which has no cargo-carrying capacity, but is only for fast sailing, through fig. 2, which has fair cargo-carrying capacity, to fig. 1, which has room for cargo, also for engines, boilers, and coal-bunkers.

In fig. 3, excess of shoulder gives great stability; but the enormous keel necessary to make her weatherly gives considerable skin-friction. If it is an iron vessel, the bottom will probably be elliptical, if wooden, peg-top shaped. For medium carrying capacity the shoulders are the same and the under-body larger, which slightly lessens stability. In fig. 1 there is such increase of under-body and bottom that it is necessary to give stability either by ballast or by putting the boiler, engines, and coal-bunkers low. The midship section, fig. 3, will go better with a given amount of sail or engine-power than either of the others, and can carry more sail by reason of the greater shoulders. The vessel with large under-water body is harder to drive, because of the greater cross-section immersed; and is less stable, because of the excessive flotation on her deep bottom. Such a vessel could carry very little sail. Fig. 3 has little room for engines, boilers, and machinery; therefore is best suited for a fast sailing-vessel; fig. 1 for a fast steamer; fig. 2 for sails and steam together. The powerful, weatherly, lively, fast type, in fig. 3, would do for a pleasure-vessel; the tender, easy, sluggish, roomy type, in fig. 1, would be a good-paying steam freight-vessel, or passenger-vessel. While this greatest area of cross-section is called the midship cross-section, it is in reality where the vessel is widest, about six-tenths of the vessel's length, back of the centre of length.



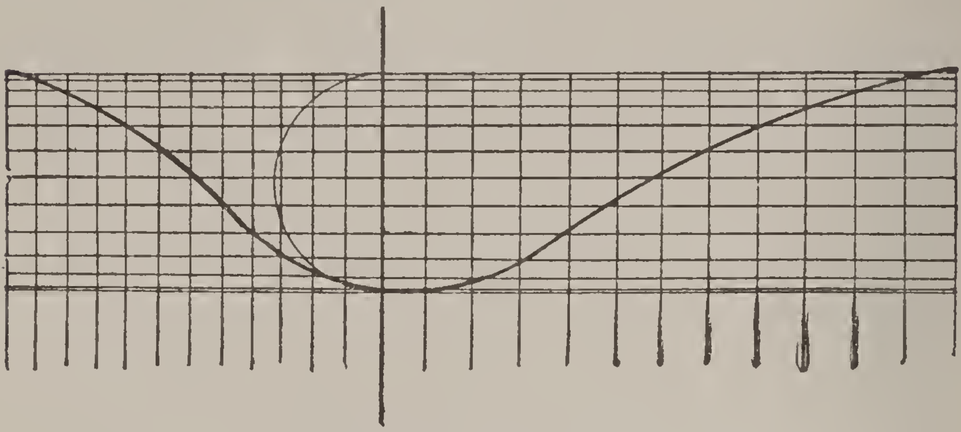
Half Body Plan, Clipper--
Lord of the Isles.



Half Body Plan, Yacht—
America.

For the chief water-line there is one best curve, varying according to the proportion between the length and the breadth of the vessel, and the exact place of greatest width;

but in every case being that giving least resistance to passage through the water. To get this curve, a line is laid down representing on a convenient scale (see fig.)



Shortened Wave Line.

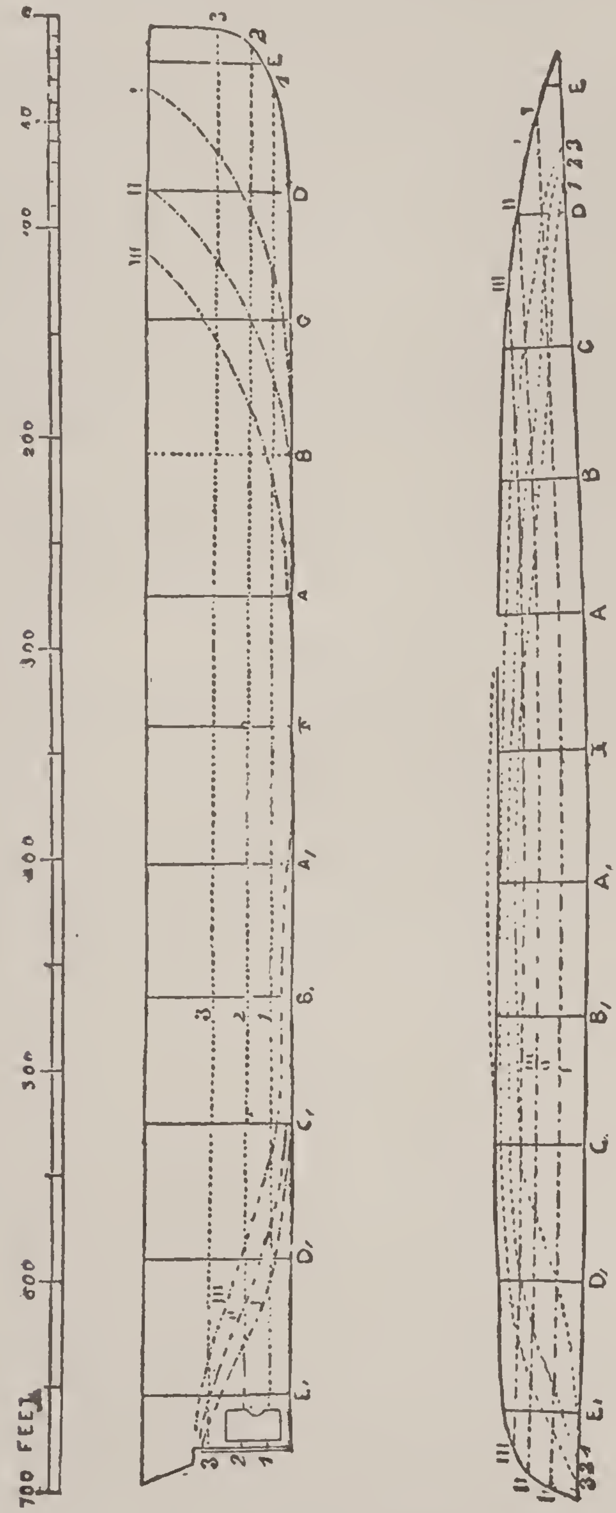
the length of the vessel and a few feet to spare: at about six-tenths its length, from the bow, another is laid down, at right angles to the first, and representing half the beam; the centre-line forward of this is divided into a convenient number of equal parts, and so is the centre-line back of it into the same number of equal but of course shorter parts. At each division a cross-line is drawn. Upon the line representing half the beam, a semicircle is drawn, and divided into as many equal arcs as each of the parts fore and aft of the greatest breadth-line was divided into. Through these division-points lines are drawn, parallel with the lengthwise centre-line. The points of intersection of these lengthwise lines with the cross-lines being joined, form a true wave water-line. A small portion of the front of this is cut off, to leave a definite thickness of material at the bow.

Next comes the sheer plan—i.e., the outline that it forms when looked at sidewise, flat on. The upper line of this is the deck or the bulwark; the bottom the keel-line; the front the stem or cut-water, and the aft part the stern post line. The first important thing is to get the chief buttock-line, which must be formed by the intersection with the skin of the vessel of a vertical plane parallel with the keel plane. It should be one-fourth of the breadth from the centre. It will sometimes be very remarkable. Just what this line is, depends on the architect. For river-work its character is not very important; but for sea-service it is.

The main-deck-line is the outline of that deck which it is intended to keep always well out of the water. Above that it should be possible to keep all ports open in any ordinary weather.

For a fast vessel the main-deck should have a fine sharp point, else the ship will pitch in a sea-way, and be slow. While this seems not to give the desirable large roomy deck forward, nor to permit bow-chasers to be worked well, it simply adds to the necessary deck and front extension. Advantage should not be taken of this extra room forward of the foremast to put the working parts on the bow any further forward. Covering this fine forward deck keeps the vessel dry, gives the crew good quarters, and leaves the desired 'broad roomy deck' aft. Convenience in working bow-guns has been got by carrying the bulwarks around back of the stem, letting the real deck beyond the bulwark form a part of the head.

SHEER DRAUGHT. HALF BREADTH PLAN.

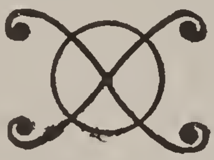


Great Eastern.

A roomy stern gives large passenger-cabins paying a high price, or a fine roomy poop with plenty of space for working a heavy pivoted gun; and makes a safe vessel in scudding before the wind, and a stable one in every case. Whether the stern shall be round or square makes very little difference. It is usually desirable to project it well aft.

The lower water-lines should in the entrance be of the same general character as the main water-line. This may give trouble near the keel, where they seem to lengthen out naturally. In the aft body they should deviate from the main water-line, giving a stern fine below and full above, just the opposite from the bow. There should be at least three water-lines laid down to enable calculation of the volume of the vessel, etc.

Naval Construction.—In 'laying down' a vessel, the constructor makes full-sized drawings, upon the mold-loft floor, of the frame and skin; makes 'molds' or full-sized patterns to correspond with the 'molding' side of the various pieces; and 'bevelling boards,' which are flat wooden pieces showing the bevels of the various parts. The first drawings are made with chalk; then those which are unnecessary for preservation are erased, and the others scribed in.

The builder does not trouble himself with water-lines, but works from the keel, which is the first line that he lays down. To it every frame is drawn perpendicular, and on it he marks  to represent the midship section. From this mark he counts every distance fore and aft. From the keel he reckons every vertical distance. Every frame must be drawn in full size as a vertical section. It may come out that no one of the ship-builder's vertical sections corresponds with any one of the designer's.

Having got the cross-frames, the skin or planking has to be laid down. The plank-lines or rib-band-lines show the way that the planks would lie most easily over the cross-frames. For iron vessels it is desirable not to require unnecessary twisting, which is expensive and weakens the plates. On every frame there must be a 'sirmark' where each rib-band piece cuts it. From the curves as laid down, lines are drawn at right angles to the centre-line, and these enable the lines to be reproduced as the molding edges of the mold-frames. The joints in the various pieces which go to make up a frame must lie in a diagonal line, which must be shown. There must also be laid down in full size the molding edges of the frames, breast-hooks, transoms, etc. The mold is made up of slender wooden strips called battens. As the frames have a bevel by reason of the fining of the hull, fore and aft, there must be frames showing the amount of bevel of the outer edge of each frame, at each rib-band. Then the half-skin of the hull is drawn expanded, or as though it were flattened out, the frames and the seam-line being shown. Where a vessel is laid down from the water-line model the outer lines of the latter usually represent the inner surface of the ship's skin—that is, the molding edges of the frames; and the molds may be made from such a model by measuring the distance of a convenient large number of points vertically from the keel and horizontally from the centre-line.

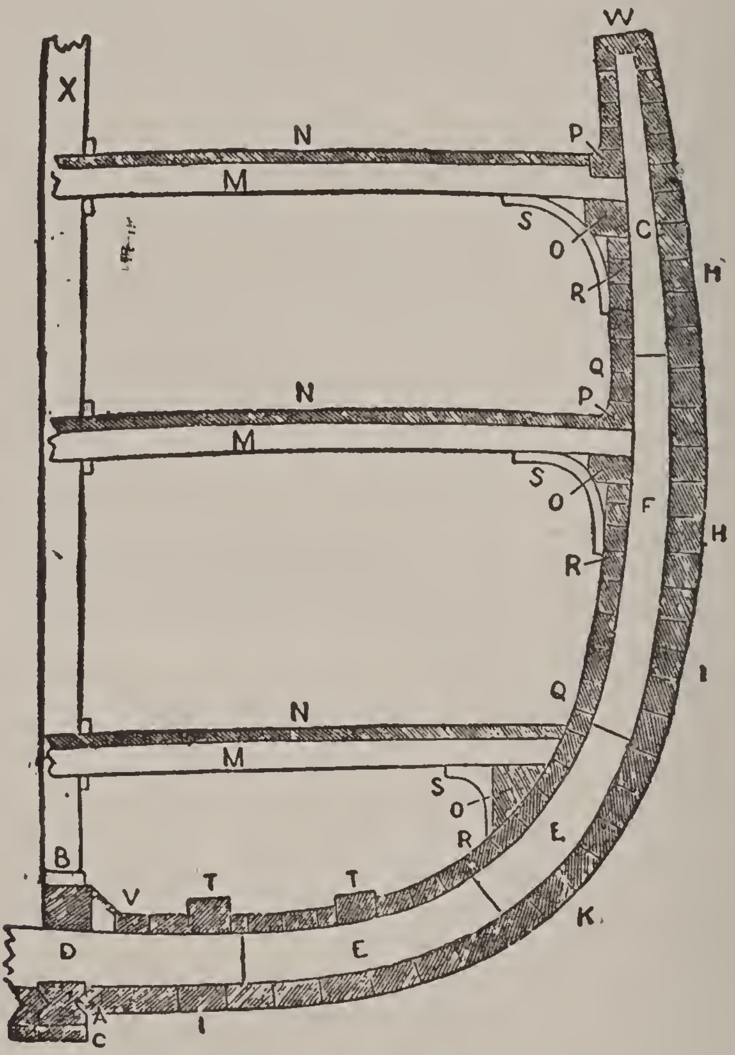
When the work is laid down, the timbers are selected and the mold-lines laid down upon them, or the iron frames and plates are bent to the desired forms. In conversion there is 50 per cent. difference in the amount of material needed to build the same ship, some constructors being more wasteful than others.

The frames or ribs of a wooden vessel are built up of two layers side by side, breaking joints, and called floors, cross-timbers, half-floors, first, second, third, etc., futtocks, lengthening pieces, and long and short timbers. In an iron vessel the frames are of L, T, or other section of iron beams; and usually the floor is composed of two ranges of beams, one above the other, and connected by lattice-work or diagonal bracing to make the bottom of the hull in effect a truss.

As at the ends the outlines rise comparatively sharply from the keel, and as the cant-frames have considerable rise, it is necessary to use timbers naturally crooked, or else to steam and bend them to convenient shape. At the ends the futtocks are worked into the dead-wood instead of into the floors, etc. The stem is strengthened by a timber back of it, called the apron. In building a wooden hull, the frames are put together on the ground, their sides fastened together by cross-spalls, and then each is hoisted into place as a whole, and held in a vertical position by shores. Where two timbers butt together end to end, they are strengthened either by coaks or dowels, which are cylindrical tenons, or by chocks, which are pieces lying in the angle or curve at the joint, and fastened to both pieces. Each side of the stem are stout timbers called knight-heads, to which the bow is fastened; and each side of these are six or seven 'hawse-pieces' without any spaces between them, and through which are worked the hawse-holes for the passage of the cables. The frames in the bow are held together by forked pieces called breast-hooks. Below the keel there is sometimes fastened a false keel to give weatherliness; this being comparatively lightly fastened on, so that, if the vessel should ground, there would be no danger of the keel itself being broken out. Above the keel and the floors there is a lengthwise piece called the keelson, which stiffens the vessel vertically; and on the floors and parallel with the keelson there are, near the mainmast, sister-keelsons or side-keelsons.

In some wooden vessels the entire frame is filled in with timber, and payed, up to a point somewhat above the water-line; so that even if the planking was ripped off the vessel would not leak. The timber thus used is cuttings which have no other constructive value. Filled-in vessels are not only stronger than others, but cleaner, as there is no place between the frames for accumulation of filth; for this reason they are healthier. In addition, the timbers last longer, as every one is exposed only to air or to water, never to alternations of these. In iron vessels the space between the frames may be filled in with cement, bricks, gas-coke, or other materials, or with asphalt mixture.

The frame-timbers are often strengthened by diagonal iron strapping or bracing. In what is known as Gordons' system, wooden trusses are put between the lower and the upper decks, in those points where the vessel is vertical-sided. In long shallow vessels like our river steamboats, it is necessary to have a hog-frame, a lengthwise truss-like member consisting usually of an upper and a lower stringer (the latter of which may be a keelson) connected by a skeleton-framework; instead of the upper stringer, such shallow vessels have, sometimes, iron rods running in a vertical plane over the tops of the stout masts, which are stepped into a lengthwise keelson or other stringer.

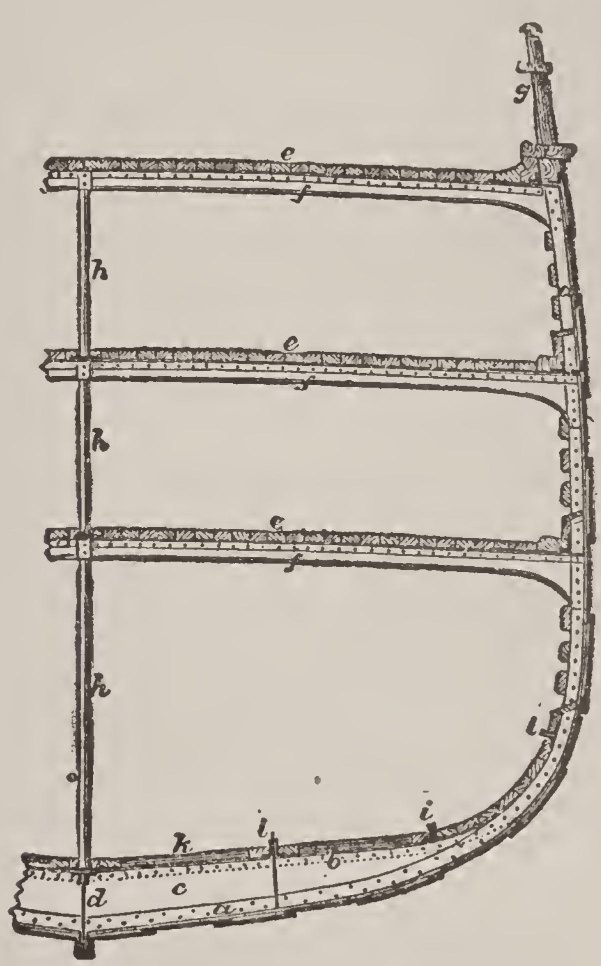


Rib and Decks of a Wooden Vessel, in Section:

A, keel; B, keelson; C, false keel; D, floor; E, E, futtocks; F, top-timber; G, lengthening piece; H, H, wales; I, diminishing planks; K, bottom planks; L, garboard strakes; M, beam; N, deck; O, shelf; P, waterway; Q, spirketing; R, clamps; S, knees; T, side-keelsons; V, limber strakes; W, rough-tree rail; X, mast.

The decks rest upon beams, which in turn are supported by shelves or lengthwise bracket-like pieces. In wooden vessels these shelves are bolted to the frame-timbers by long copper through-bolts.

The bends or wales of a wooden hull are usually of oak 4½ to 10 inches thick. The strakes next the keel are of elm or oak, and are called the garboard strakes. Endeavor is made to bend the stuff as little as possible in an edgewise direction, as this injures the fibres more than more flatwise bending to follow the water-ilnes. The planks are fastened to the frames either by treenails or headless wooden bolts holding principally by friction, or by copper bolts. The outer planking is first put in place and temporarily fastened; next the inner skin is put on; and then the permanent fastenings may be driven through both the inner and the outer skin.



Cross Section of Iron or Steel Ship:

a, frames; *b*, reverse angle-irons; *c*. floors; *d*, keelson-plate; *e*, *e*, decks; *f*, *f*, deck-beams; *g*, bulwarks; *h*, *h*, stanchions; *i*, *i*, bilge-keelsons; *k*, ceiling.

In the case of an iron ship, the plating is marked out in accordance with the development or expansion of the skin; care being taken to render it necessary to bend the plates edgewise as little as possible. Lines are laid down on the plates on those sides which are to lie next the frames. An iron vessel may or may not have an inner skin. If there is one, it may be of iron or of wood; the latter strengthening the vessel little or not at all.

Very large iron vessels have their bottoms formed of two complete water-tight hulls one within the other, the two being divided into water-tight compartments or cells of comparatively small size. This stiffens the vessel and renders it much tighter in case of accident; for though a hole should be punched through the outer hull, or its plates be displaced, the inner might escape injury.

An iron vessel may have its hull divided crosswise by bulk-heads into water-tight compartments, so that if a hole be stove through the hull, admitting water into one of these bulk-heads, only that one will fill; the others having sufficient floating power to prevent sinking. In some iron vessels there are also lengthwise partitions.

A wooden vessel may or may not have a complete inner planking or skin; but for stiffening purposes it is usual to work over the flooring heads (that is, the outer ends of the floor-timbers) thick strakes or lengthwise timbers. The next one each side of the keelson is called the limber strake; and along between each of them and the keel there is a 'limber' or passage for bilge-water. To the rest of the inside planking in the hold is given the name of 'ceiling' or 'foot-waling.' Just below the shelf-pieces which support the deck-beams of a wooden vessel are strakes which are called clamps; and in old vessels the beams rested on the clamps themselves instead of on shelves. Along the ends of the beams, above them, the planks are called spirketing; between these and the clamps the inside planking is called quickwork.

The deck-beams in an iron vessel are always of iron; in a wooden vessel they may be of either iron or wood. In either case they have a slight camber or round-up, designed to free the decks readily from water. In iron vessels the beams are tied to the frames by iron knees or bracket-ends; in wooden ones, by either wooden or iron knees.

After the deck-beams are in place, and the spirketing worked into place, the decks must be framed. The mast-holes or mast-rooms are first made. In this the masts are wedged by fore-and-aft partners, cross-partners, and corner chocks; and about each mast-hole there should be a coaming.

In a man-of-war the decks, beams, stanchions, and bulk-heads must be strong enough to stand the weight and the recoil of the battery, as well as the strain given by the weight of the vessel itself and the action of wind and wave. Where the hull is pierced by port-holes, the lengthwise strength would be impeded if the framing above and below the ports were not made of extra strength, as by giving a double skin above and below the holes, and by having lengthwise stringers outside.

Composite ships are intended to combine the durability and small skin-friction of the copper-sheathed wooden hull with the strength, lightness, and cheapness of the iron frame.

In an iron ship all the seams and rivet-joints must be calked to make them water-tight: this is done by making with a rounded tool an indented groove parallel and close to the joint, thus forcing the faces close together at the joint. In a wooden vessel the treenails and plank-seams are calked by driving around or into them threads or layers of oakum. Wooden and composite vessels must be protected at least as high as the water-line by a sheathing of copper or mixed metal; above that by paint. Sheathing is done usually in a dock after launching, and sometimes not until after the vessel has made several voyages to test her tightness. Iron ships sheathed with copper or yellow metal should have insulation between the sheathing and the iron: this is sometimes effected by coating the iron skin with pitch, or fastening on a thin wooden skin, on which the sheathing is nailed. After calking comes inboard and outboard fitting, after which (in the merchant service) there is finding; then launching.

The appliances for launching vessels may be divided into two particular parts—the load-ways or sliding-ways, and the cradle which slides upon the ship-ways and supports the vessel. The sliding-ways are parallel and slightly inclined timber platforms: upon them are bolted strips forming ledgers, to guide the cradle during the launch. The cradle stands upon two lengthwise, nearly horizontal timbers called bilge-ways, upon which the ship is supported by poppets or posts fastened temporarily to her bottom. If a vessel is coppered before launching, the cradles and stays are held together by strong chains fastened under the keel. The ends of the chains all along one bilge-way are arranged with bolts having very long forelocks, by which they may be slipped after the ship is afloat.—In France, vessels are launched on their keel instead of on their bilge.

See Deck: Mast: Capstan: Chains: Hold: Keel: Rigging: Sail: Sheathing: etc.: also A1.

In the U. S., in the year 1900 there were reported 457 ship-building estab., which had a combined cap. of $50,632,939, employing 30,954 hands, paid $16,826,915 wages, used materials val. at $22,536,963, and yielded products val. at $51,981,881. See Shipping.

During the year 1902, June 30, the Bureau of Navigation reported that the prod. of new vessels of all kinds was 1,657, of 473, 981 gross tons. The table on following page shows the class, number, and gross tonnage of vessels built in the U. S. from 1885 to 1902, inclusive.

The tonnage of vessels built in the United Kingdom 1890 was 1,253,009, to which should be added the new tonnage completed in govt. shipyards, total 1,276,129. Of the 874 vessels of 1,253,609 tons, 106 of 36,031 tons were of iron, and 100 of 164,054 tons, with 123,468 tons of the Clyde output, were for foreign and colonial waters. The output 1890 was 79 vessels more than 1889, but the tonnage was 50,000 less; still 1890 was one of the greatest shipbuilding years in British annals, and showed an advance of 26,129 tons on the great shipbuilding year 1883. The capacity of all the yards for turning out tonnage was greater 1890 than it had ever been, and all the berths were fully occupied. The falling off in tonnage was attributed to increased cost of production, strikes, and various labor troubles.

TONNAGE OF VESSELS BUILT IN THE UNITED STATES IN 1885-1902.

Year Ending June 30.	On the New England Coast.		On the Entire Seaboard.		On the Mississippi River and its Tributaries.		On the Great Lakes.		Total Tonnage Built.	
	No.	Tons.	No.	Tons.	No.	Tons.	No.	Tons.	No.	Tons.
1885	173	48,128	722	121,010	81	11,220	117	26,826	920	159,056
1886	111	30,624	554	64,458	76	10,595	85	20.400	715	95,453
1887	101	24,035	613	83,061	79	10,901	152	56,488	844	150,450
1888	150	33,813	708	105,125	84	11,859	222	101,103	1,014	218,087
1889	174	39,983	769	111.852	83	12.202	225	107,080	1,077	231,134
1890	208	78,577	756	169,091	104	16,506	191	108,526	1,051	294,123
1891	327	105,491	1,066	237,462	114	19,984	204	111,856	1,384	369,302
1892	366	60,624	1,127	138,863	99	14,801	169	45,969	1,395	199,633
1893	152	37,091	690	102,830	91	9,538	175	99,271	956	211,639
1894	192	28,665	650	80,099	82	9,111	106	41,985	838	131,195
1895	145	26,783	527	67,127	74	8,122	63	36,353	694	111,602
1896	163	39,582	511	102,544	95	15,771	117	108,782	723	227,097
1897	98	21,942	673	103,504	98	11,792	120	116,937	891	232,233
1898	127	23,944	742	112,879	123	13,495	87	54,084	952	180,458
1899	144	68,761	937	196,120	214	23,552	122	80,366	1,273	300.038
1900	199	72,179	1,107	249,006	215	14,173	125	130,611	1.447	393,790
1901	201	82,971	1,094	291,516	311	22,888	175	169,085	1,580	483,489
1902	225	75,851	1,197	290,124	161	8,836	133	168,873	1,491	468,833

CLASS, NUMBER AND GROSS TONNAGE OF VESSELS BUILT IN THE UNITED STATES IN 1885-1902.

Year Ending June 30.	Sailing Vessels.						Steam Vessels.		Canal Boats.		Barges.		Grand Total.	
	Ships and Barks.	Brigs.	Schooners.	Sloops.	Number.	Gross Tons.	Number.	Gross Tons.	Number.	Gross Tons.	Number.	Gross Tons.	Number.	Gross Tons.
1885	11	0	379	143	533	65,362	338	84,232	21	2,283	28	7,079	920	159,056
1886	8	1	276	120	405	41,237	240	44,467	23	2,979	47	6,770	715	95,453
1887	7	1	258	181	447	34,536	299	100,074	36	4,180	62	11,563	844	150,450
1888	4	0	275	144	423	48,590	430	142,006	40	4,263	121	23,227	1,014	218,086
1889	1	0	296	192	489	50,570	440	159,318	88	9,452	60	11,794	1,077	231,134
1890	10	0	347	148	505	102,873	410	159,045	40	4,346	96	27,858	1,051	294,122
1891	13	1	447	272	733	144,290	488	185,037	57	7,059	106	32,916	1,384	369,302
1892	8	0	423	415	846	83,217	438	92,531	37	4,580	74	19,305	1,395	199,633
1893	8	1	303	181	493	49,348	380	134,368	28	3,791	55	24,132	956	211,639
1894	3	0	253	221	477	37,827	293	83,720	14	1,522	54	8,126	838	131,195
1895	1	0	188	208	397	34,900	248	69,754	11	1,225	38	5,723	694	111,602
1896	2	0	215	152	369	65,236	286	138,028	13	1,495	55	22,337	723	227,096
1897	1	0	160	177	338	64,308	288	106,153	70	10,216	195	51,555	891	232,232
1898	1	0	159	199	359	34,416	394	105,838	20	2,386	179	37,818	952	180,458
1899	3	0	223	194	420	98,073	439	151,058	13	1,411	401	49,496	1,273	300,038
1900	4	0	281	219	504	116,460	422	202,528	38	4,492	483	40,310	1,447	393,790
1901	6	0	259	261	526	126,165	506	273,591	79	9,078	469	76,655	1,580	483,489
1902	9	0	316	256	581	97,698	579	308,180	44	4,539	287	58,416	1,491	468,833

The following table shows the ships launched in the principal shipbuilding districts of the United Kingdom during 1901:

Districts.	Steam.		Sail.	
	No.	Tons Gross.	No.	Tons Gross,
Aberdeen	31	6,203	....	....
Barrow, Maryport and Workington	3	1,547	6	1,268
Belfast	18	149,705	....	....
Dundee	10	18,529	3	580
Glasgow	120	269,977	13	4,629
Greenock	58	149,446	5	14,370
Hartlepools and Whitby	41	150,607	....	....
Hull and Grimsby	29	7,359	3	567
Leith	15	16,492	3	750
Liverpool	12	6,155	1	13
London	2	406	4	610
Middlesbro and Stockton	46	161,058	....	....
Newcastle	116	292,989	....	....
Sunderland	76	268,069	....	....

Table shows the ships launched in the principal ship-building districts of the United Kingdom during 1901.

SHIPKA PASS, *shĭp'kâ:* pass in Bulgaria near the centre of the Balkan Mts., 3 m. n. of the village of Shipka, 14 m. s. of Gabrova; elevation 4,736 ft. It became famous from the fierce struggle here, 1877, Aug. and Sep., between the Turks under Suleiman Pasha, who made a number of unsuccessful efforts to force the pass, and a body of Russians who had seized it after crossing the Balkans by the Hainkoi Pass, and who had previously been defeated by Suleiman at Eski Sagra. The loss was great on both sides, but the Turks lost more than twice as many men as the Russians.

SHIP-MONEY: ancient tax resorted to in England at various times; revived in the reign of Charles I., without authority of parliament, for equipment of a fleet. In 1007, when the country was threatened by the Danes, a law was made obliging all proprietors of 310 hides of land to equip a vessel for protection of the coast. Elizabeth, at the time of the threatened Spanish invasion, required the various ports to fit out a certain number of ships at their own charge; and so great anxiety was shown by the public for the national defense, that London and some other ports furnished twice as many vessels as had been demanded. In 1626 Charles had recourse to an impost of this sort, requiring each of the maritime towns, with assistance of the neighboring counties, to arm a given number of vessels, 20 being required from London. In 1634 the tax was extended over the whole kingdom. A general spirit of resistance was immediately aroused, not so much in consideration of the amount of the tax, as of the objectionable feature that it was imposed by the arbitrary authority of the king alone, which had come to be regarded as an unwarrantable stretch of the royal prerogative. In 1637, the celebrated John Hampden (q.v.), a gentleman of property in Buckinghamshire, resolved to confront the power of the govt. by disputing the legality of this exercise of the preogative, and resolutely refused payment of the impost, an example in which he was followed by nearly the whole county to which he belonged. He was prosecuted in the exchequer chamber for non-payment, and his trial was watched with great interest and anxiety by the nation on account of the constitutional point involved in it. The judges, four excepted, pronounced in favor of the crown; but the trial had the effect of thoroughly arousing the public mind to the danger of imposition of taxes by the royal authority alone. The Long Parliament, shortly after its meeting in 1640, voted ship-money illegal; and declared the sheriffs and others who had been employed in assessing or collecting it to be delinquents; and cancelled the sentence against Hampden.

SHIPPEN, *shĭp'ĕn*, WILLIAM, M.D.: physician and surgeon: 1736, Oct. 21—1808, July 11; b. Philadelphia. He graduated at Princeton 1754, and studied medicine with his father in Philadelphia, with Drs. William and John Hunter in London, and Dr. McKenzie in Edinburgh. In 1762 he returned to Philadelphia and began practice, and began also the first course of lectures in this country on anatomy. When in 1765 the Coll. of Philadelphia, of which he was one of the founders, was opened, he was made prof. of anatomy and surgery. In 1780 he was elected to the same position in the Univ. of the State of Pennsylvania. In 1791 these two schools were united under the name Univ. of Pennsylvania, and he was again elected to the place, where he remained until 1806. In 1777 he formed a plan for the organization of a hospital dept., which with a few changes congress adopted; and Dr. S. was elected director-gen. of all the military hospitals of the United States, but owing to charges of mal-administration, never substantiated, he resigned 1781. He was for more than 40 years sec. and curator of the Amer. Philos. Soc. He died at Germantown, Penn.

SHIP'PING: vessels collectively.—For S. in law, see NAVIGATION LAWS: MERCHANT SHIPPING ACTS: also BILL OF LADING: CHARTER-PARTY: PART-OWNER: SHIP'S HUSBAND: DEMURRAGE: STOPPAGE *in Transitu*: FREIGHT: AVERAGE: BOTTOMRY: RESPONDENTIA: SALVAGE: SEAMEN.

The following table shows the number and tonnage of sailing-vessels, steam-vessels, canal-boats, and barges in the United States, 1890, June 30:

MERCHANT SHIPPING OF THE UNITED STATES, 1890.

States, etc.	Sailing-vessels.		Steam-vessels.		Canal-boats.		Barges.		Total.	
	No.	Tons.	No.	Tons.	No.	Tons.	No.	Tons.	No.	Tons.
Maine	1,921	331,916·05	128	31,040·64	....	....	10	10,972·53	2,059	373,929·22
New Hampshire	46	7,714·23	9	424·79	....	....	....	....	55	8,139·02
Vermont	13	1,108·44	8	3,156·63	16	1,604·05	....	....	37	5,869·72
Massachusetts	1,564	317,070·89	167	78,736·92	....	....	13	5,567·49	1,744	401,375·30
Rhode Island	175	14,285·66	58	24,205·56	....	....	2	689·15	235	39,180·37
Connecticut	432	55,732·18	166	37,374·76	1	125·44	181	31,509·80	780	124,742·18
New York	2,300	450,196·80	1,363	531,330·00	871	89,679·32	706	152,806·31	5,240	1,224,012·43
New Jersey	982	58,920 66	100	13,115·01	1	139·28	66	21,157·18	1.149	93,332·13
Pennsylvania	483	135,376·73	473	147,242·17	208	23,404·69	51	12,246·40	1,215	318,269·99
Delaware	162	14,846·14	31	4,230·86	....	....	....	....	193	19,077·00
Maryland	2,050	78,065·15	165	57,436·97	....	....	14	1,871·72	2,229	137,373·84
Dist. of Columbia	84	2,073·18	40	9,924·65	....	....	....	....	124	11,997·83
Virginia	1,181	28,710·91	112	9,979·38	....	....	7	273·43	1,300	38,963·72
North Carolina	320	8,605·41	82	6,092·49	....	....	....	....	402	14,697·90
South Carolina	167	6,167·21	61	7,359·83	....	....	....	....	228	13.527·04
Georgia	90	10,127·71	59	23,747·29	....	....	2	865·32	151	34.740·32
Florida	431	24,301·51	133	10,494·86	....	....	....	....	564	34,796·37
Alabama	84	7,234·25	43	4,592·54	....	....	17	1,341·48	144	13,168·27

MERCHANT SHIPPING OF THE UNITED STATES, 1890.

States, etc.	Sailing-vessels.		Steam-vessels.		Canal-boats.		Barges.		Total.	
	No.	Tons.	No.	Tons.	No.	Tons.	No.	Tons.	No.	Tons.
Mississippi	169	7,034·63	51	6.917·48	....	....	....	....	220	13,952·11
Louisiana	357	12,363·41	177	49.457·48	....	....	2	237·44	536	62,058·33
Texas	183	5,178·93	43	3,628·40	....	....	6	935·72	232	9.743·05
Tennessee	....	....	103	18.312·33	....	....	....	....	103	18.312·33
Kentucky	....	....	88	17,695·43	....	....	....	....	88	17.695·43
Missouri	....	....	133	43,354·47	....	....	93	85,921·92	226	129,276 39
Nebraska	....	....	13	969·85	....	....	....	....	13	969·85
Iowa	....	....	71	10,640·35	....	....	15	738·42	86	11,378·77
Minnesota	1	11·23	67	5.542·75	....	....	12	2,963·83	80	8,517·81
Wisconsin	235	36,918·32	183	60.195·84	....	....	14	1.004·96	432	98.119·12
Michigan	551	135,045·25	612	211.988·96	....	....	15	2,998·06	1,178	350.032·27
Illinois	183	43,337·65	178	31.707·53	....	....	4	152·66	365	75.197·84
Indiana	....	....	59	7.827·49	....	....	1	248·86	60	8.076·35
Ohio	157	78,432·13	350	197.994·67	....	....	2	566·70	509	276,993·50
West Virginia	....	....	88	8,590·09	....	....	....	....	88	8,590·09
California	703	184.595·11	252	122.837·87	....	....	....	....	955	307.432·98
Oregon	34	4.497·43	154	38,896·10	....	....	8	5,972·98	196	49.366·51
Washington	88	49,207·05	136	21.485·51	....	....	....	....	224	70,692·56
Alaska	18	339·02	9	560·48	....	....	....	....	27	899·50
Total	15,164	2,109,413·27	5,965	1,859,088·43	1,097	114,953·38	1,241	341.042·36	23.467	4,424,497·44

SHIPPING.

The progress made by the U. S. mercantile marine of the great lakes 1886–90, as shown in the reports of the 11th U. S. census, is probably unparalleled in the history of commerce. In 1886 the net tonnage was 634,652 tons; (1890) 826,360: increase 191,708 tons. The estimated value of the vessels (1886) was $30,597,450; (1890) $58,128,500. The following table shows the process of the change as regards structure, material, and mode of propulsion of vessels:

FLOATING EQUIPMENT ON THE GREAT LAKES 1886–90.

CLASSIFICATION OF VESSELS.	Number of Vessels.	
	1886.	1890.
A—STRUCTURE:		
Side-wheel Steamers	43	42
Propellers under 1,000 tons	335	431
" between 1,000 and 1,500 tons	72	122
" over 1,500 tons	21	110
Tugs	466	448
Schooners	730	577
Barges	330	325
B—MATERIAL:		
Steel	6	68
Iron	35	39
Composite	2	13
Wood	1,954	1,935
C—SAIL OR STEAM:		
Steam-vessels	937	1,153
Sailing-vessels	1,060	902

It is seen that sailing-vessels are fast giving place to vessels propelled by steam. Taking schooners and barges together, and comparing 1886 with 1890, we find a decrease of 14·91 per cent. in number, 2·29 per cent. in tonnage, and 13·38 per cent. in value. Taking schooners and barges separately, we find the greater decrease in schooners. Though the number of barges was less in 1890, there was an increase of 14·34 per cent. in barge tonnage.

The table shows that the steamers built are of constantly increasing size; but the tonnage of propellers increased more rapidly than their numbers. Thus, the total tonnage of the 21 vessels of over 1,500 tons (1886) was 34,868 tons, while the total tonnage of the 110 vessels of that class (1890) was 188,390 tons. The total value of that class of vessels (1886) was $2,645,000; (1890) $17,737,000.

Steel is more generally used for large vessels than iron, composite, or wood. There were only 6 steel vessels afloat on the lakes (1886), aggregate tonnage 6,459, aggregate value $694,000: (1890) 68 steel vessels, tonnage 99,457, value $11,270,500. These facts show that the traffic of the lakes is rapidly coming under the control of companies that can command large capital.

During the season of 1889 (234 days) more tons of freight passed through the Sault Ste. Marie canal than through the Suez canal in the full year. In 1899 the net tonnage was 25,255,810; that of the Suez Canal, 9,895,630.

SHIP RAIL'WAY: see INTEROCEANIC SHIP RAILWAY.

SHIP'S HUSBAND: agent appointed by the owner of a ship to oversee its general interests. His duties may be modified by contract with the owner, but in general he must see that the ship is in proper repair, provide necessary equipment, officers and seamen, and requisite stores and provisions. He must attend to clearances, settle all contracts, make proper Charter-parties (q.v.) or freight-contracts, and preserve documents that may be necessary in case of dispute with insurers or freighters. The S. H. has no lien on the ship, cannot borrow money for its use unless specially authorized, and cannot insure the vessel.

SHIPTON, *ship'ton*, 'MOTHER': prophetess: said to have lived 1486–1561. It is certain that she gained local fame for prophecy in Yorkshire during the reign of Henry VIII. Her birthplace is unknown. Among the many contradictory statements concerning her, one is that her first name was Agatha, another Ursula, and still another that she had none. Of her last name, it is said that it was that of her husband, Toby Shipton, of her father, Solomon Shipton, and of her mother. After her death, collections of her prophecies frequently appeared, which extended her fame throughout England; but there is reason to believe that the most or a part of all of them were spurious. In 1862 a collection appeared in which was a prediction that the end of the world would come in 1881, which aroused the fears of many superstitious people, which fears were not dispelled even when the compiler of the collection, Charles Hindley, admitted that this prophecy was his own invention.

SHIP'WRECK: destruction of a vessel by shattering, sinking, or other means; also (rarely) the remains of a vessel so destroyed. Many nice distinctions have been made as to what goods constitute wreck, which is distinct from goods floating: see FLOTSAM.

A wrecked ship—i.e., one rendered absolutely unnavigable by injuries, as also the parts of a wrecked ship and her cargo cast upon the shore—was by early Eng. law declared property of the crown. By successive statutes the rights of owners were more and more largely recognized, until now the owner's right to recover 'jetsam, flotsam, lagan, and derelict' (see these titles), including all his property of whatever kind involved in a wreck, is recognized, subject only to charges for SALVAGE (q.v.). Wreckage unclaimed by any owner within a year and a day from its finding is sold on account of the public treasury. In the United States an act of congress of 1825 (*Revised Statutes*, §5358) declares the following acts to be felonies, punishable by fines and imprisonment: stealing, plundering, or destroying any money or goods from or belonging to any vessel, boat, or raft, in distress, lost, or stranded; wilfully obstructing the escape of any person endeavoring to save his life from such ship, boat, or raft; holding out or showing any false light or lights, or extinguishing any true one, with intention to bring any vessel, boat, or raft on the sea into danger or distress or shipwreck. The legislation of the several states as to wreckage cast on the shore is generally in favor of the owner. A decision of the U. S. dist. court of Mass. (1829) declares that, failing an owner, the United States govt. is entitled to derelict wrecks and goods found at sea; but in the s. dist. of Florida such derelicts belong to the finder or salvor, subject for a year and a day to the claim of the owner (*U. S. Revised Statutes,* §§4239–4241). A wrecked vessel of foreign construction may, after repairs made in this country, receive a U. S. register.

In 1882 there were 1,790 wrecks reported in all seas. (1881) 2,039; (1880) 1,680. In 1882 on Brit. coasts there were 576 wrecks, 4,129 lives lost. In 5 years 21,763 persons perished by sea. In the United Kingdom, the Royal National Life-boat Institution (founded 1824) had (1889) 300 life-boats on the coast, and since organization had saved 34,670 persons; and the Life Rocket Service (since 1854 under control of the Board of Trade) had 303 stations of all kinds, and saved (1889) 226 persons. The French Soc. for Saving Life from Shipwreck (founded 1865) had (1881) 453 stations of all kinds, and that year saved 240 persons and 16 vessels The German Assoc. for the Rescue of Life from Shipwreck (founded 1865) had (1881) 74 life-boat stations, and that year saved 122 persons and 2 vessels.

The U. S. Life-saving Serv. (q.v.) organized 1871 had (1902) 272 stat. In that year there were 385 disasters to large ves. and 361 casualties to small craft; 51 ves. were totally lost; property worth $4,220 was involved, of which $12,292,795 was saved; 4,220 persons were imperilled, of whom 25 were lost; and 712 shipwrecked persons were succored at the sta. Since organization prop. worth 158,370,977 out of $201,300,529 involved was saved; 1,003 per. of 98,081 imperilled were lost; 16,661 shipwrecked per. were succored at the stations.

SHIRAS, *shī'răs*, GEORGE, JR., LL.D., 1832—— ; b. Pittsburg, Pa.: jurist. He was educated at the Ohio univ. and the Yale law school, and admitted to the bar at Pittsburg. He has since practiced in that city, having been concerned in nearly every important suit tried in w. Penn. since his admission to the bar. In 1892, July, he was nominated by Pres. Harrison to be an assoc. justice of the U. S. supreme court, succeeding Judge Bradley, and was inducted into office in Oct. following. S. received the degree LL.D. from Yale univ. He is a cousin of the late James G. Blaine.

SHIRAZ, *shē'râz'*: famous city of Persia, cap. of the province of Fars; formerly a flourishing city, and the ordinary residence of the Persian monarchs, but now divested of its ancient splendor. It is in a wide plain, on one of the limestone ledges which shoot out from the great West-Persian mountain system, 112 m. from the Persian Gulf, 35 s.w. of the ancient Persepolis (q.v.). It is inclosed by walls nearly 4 m. in circumference, and, previous to the great earthquakes which have repeatedly laid it in ruins, contained many splendid mosques, bazaars, caravansaries, and other public buildings. The houses, mostly of stone, are superior in appearance to those of most other Persian towns; and the adjoining portion of the plain is of exuberant fertility, and is laid out in vineyards and in rose-gardens of great extent. The principal manufactures are silk, cotton, and woolen goods, cutlery, firearms, glass, and earthenware. The wine of S., which is very strong and resembles Tokay, is still famous throughout the East; its quality is in question among European judges. Rose-water is still prepared in large quantities. The trade of the town is transacted in the *Bazar-i- Wukell*, about a quarter of a mile long by 40 ft. wide, accommodating several hundred shopkeepers. S. has trade with Yezd, Ispahan, and Bushire, from the last receiving Indian and European goods. The city was founded 697, and from its beautiful situation and charming climate, became a favorite resort of the Persian princes; but a destructive earthquake 1812 laid a large portion of it in ruins; and another in 1824, which cost the lives of 4,000 inhabitants, completed the wreck of its prosperity. It was, however, rebuilt, and had attained a pop. of 40,000 (pop. previous to 1812 having been almost 60,000), when a third and more terrible earthquake 1853, Apr., laid almost the whole town in ruins, and caused the death of 12,000 people. It has since been partially rebuilt in inferior style.—It is celebrated for the number and eminence of the scholars and poets to whom it has given birth; chief of these is Sibuyah, the first of Arab grammarians; Hafiz (q.v.), the 'Anacreon' of Persia, whose tomb is half a mile n.e. of the Ispahan gate; and Saadi (q.v.), whose mausoleum is 22 m. to the n.e. See *History of Persia*, by Clements Markham, 1874.—Pop. estimated 25,000.

SHIRE, *shē'rā:* river of s.e. Africa, flowing from Lake Nyassa, and after a southerly course of 250 m. joining the Zambesi. It is 80 to 150 yards broad, 12 ft. deep, and never varies more than 2 or 3 ft. from the wet to the dry season. Its current has a rate of 2½ knots an hour. The navigation is obstructed by cataracts for 35 m., in which it falls 1,200 ft.

SHIRE, n. *shīr*, but in composition *shėr*, as in Hampshire, *hămp'shėr* [AS. *scir*, a territorial division; *sceran*, to cut off, to divide: Ger. *scheren*, to cut: Dut. *scheuren*, to tear, to cut]: district or division of a country; county; territorial division under a sheriff. SHIRE-CLERK, *shīr-*, a certain officer appointed by the sheriff. SHIRE-MOTE, n. *shīr'mōt*, anciently a county court or meeting. KNIGHT OF THE SHIRE, a county M.P. in Britain.—*Shire* is a term which seems to have originated in the 8th c., and is applied to the districts, otherwise called counties, into which Great Britain is divided. A considerable number of the counties of England, as Kent, Essex, Surrey, Norfolk, Suffolk, were formed out of the petty kingdoms of the Anglo-Saxons, which, with the advancing tide of centralization, were gradually becoming consolidated into one great kingdom. As early as 800, an entry in the Saxon Chronicle relates that kings had ceased to reign among the *Hwiccas* (the inhabitants of the district afterward known as Worcestershire), and that they were governed by an ealdorman acting under Cynwulf, King of Mercia. This substitution of ealdormen (or earls) for kings marks the gradual organization of the counties. It was sometimes found convenient to divide a kingdom into several shires. The civil, military, and judicial head of the S. was the ealdorman, whose office was not necessarily hereditary, though it had sometimes a tendency to become so. Twice a year he held the shire-mote, in which he and the bishop presided with equal jurisdiction. Among other questions which would come before the shire-motes were those that related to the boundaries of the respective shires. As a border thane pushed his occupation toward the frontiers of the S. to which he belonged, and came into collision with the occupants of the neighboring S., questions necessarily arose which could be settled only by a compromise arranged by the two shire-motes, and these compromises may account for the irregular jagged boundaries which separate S. from S., with occasional isolation of particular portions. Yorkshire, Durham, Cheshire, and Worcestershire derived their name from their ancient bishoprics. Various shires which had formerly an existence in the north, e.g. Norhamshire, Islandshire, Hexhamshire, Hallamshire, Bamboroughshire, have merged into others. The term S. is nearly synonymous with county, yet not quite so, as there are certain counties with whose names the suffix 'shire' is never used. One explanation which has been given of this usage is, that the object of the addition of the syllable 'shire' is to distinguish the county from the town of the same name, and that it is therefore applicable only to counties bearing the same name with their county town. Another explanation is, that S., being a word of Anglo-Saxon origin, is not properly applied to any of the English counties except those which formed part of the larger Anglo-Saxon kingdoms. Neither of these reasons is exactly correspondent with actual usage, by which S. terminates the names of all the English counties except the following: Northumberland, Cumberland, Westmoreland, Durham, Norfolk, Suffolk, Essex, Sussex, Middlesex, Kent, Surrey, and Cornwall. In Cheshire, the final syllable of the town of Chester is dropped. Berkshire, Shropshire, and Hampshire are never used in their simple form, though sometimes abbreviated into Berks, Salop, and Hants. S. is applied to all the Welsh counties except Anglesea.

In Scotland, the English tendencies of the sovereigns from the time of Malcolm Canmore to the war of succession, and the tide of immigration from the south, brought in, among other innovations, the division into shires. Its introduction seems to have begun early in the 12th c.: 25 shires or counties are enumerated in a public ordinance of 1305. Nearly all the counties of Scotland may receive the terminal addition of shire: see STEWARTRY. The Irish counties are not generally called shires.

In England, s. of the Tees, there was a subdivision of the shires into *hundreds*, which originally, in theory at least, seem to have been districts inhabited by 100 or 120 families (or in which there may have been a hundred sureties to keep the peace), and were in some localities called *wapentakes*, these hundreds or wapentakes being further subdivided into *tithings*, inhabited by ten free families; and it became incumbent on every one to be enrolled in a tithing and hundred for purposes of civil government. In some larger counties there was an intermediate division to which that into hundreds was subordinate: Yorkshire had and still has its *Ridings* (q.v.), Kent its *Lathes*, and Sussex its *Rapes*. The division into hundreds and tithings never penetrated into the four n. counties of England, or into Scotland, where the *ward* and *quarter* were the immediate subdivisions of the county. See HUNDRED: TITHING: TRIDING: WAPENTAKE: also COUNTY: COUNTY CORPORATE.

England possessed three *counties palatine*—Cheshire, Lancashire, and Durham—of which the earls formerly possessed all the judicial and fiscal powers of the crown—all now annexed to the crown (see PALATINE). Similar privileges belong to the earldom of Stratherne in Scotland. —For county authorities see COUNTY COURTS: SHERIFF: LOCAL GOVERNMENT: ETC.

SHIRK, v. *shĕrk* [a modification of SHARK, which see]: to avoid or escape from anything by underhand proceedings; to seek to avoid the performance of duty; to slink from. SHIRK'ING, imp. SHIRKED, pp. *shĕrkt*. SHIRKER, n. *shĕrk'ĕr*, one who shirks duty or danger; a shirk.

SHIRLEY, *shĕr'lĭ*, WILLIAM: colonial gov. of Mass.: 1693–1771, Mar. 24; b. Preston, England. He emigrated to Boston 1734, and engaged in the practice of law. He was a commissioner for settlement of the boundary between Mass. and R. I.; gov. of Mass. 1741–45; and planned the expedition which resulted in the capture of Louisburg 1745. He spent 1745–53 in England; resumed the governorship 1753; and was commander-in-chief of the British forces at the beginning of the French war 1755. He became lieut.gen. 1759; was for a time gov. of one of the Bahama Islands; but returned to Mass. 1770, and died in Roxbury. He published *Electra*, a tragedy; *Birth of Hercules*, a mask; *Letter to the Duke of Newcastle*, with a journal of the siege of Louisburg (1745); and an autobiographical sketch (1758).

SHIRR, n. *shĕr:* the insertion of elastic lines or cords between pieces of cloth. SHIRRED, a. *shĕrd*, having elastic lines or cords inserted between pieces of cloth, as the strings of India rubber in men's braces; drawn up by parallel gathering threads.

SHIRT, n. *shĕrt* [Icel. *skyrta;* Dan. *skiorte;* Sw. *skjorta*, a shirt: Ger. *schurz*, an apron—from SHORT, which see]: a loose under-garment of linen, cotton, or other material, worn by men. SHIRT'ING, n. cloth for shirts. SHIRT'-LESS, a. *-lĕs*, without a shirt. SHIRT-FRONT, the part of the shirt seen under the waistcoat.

SHIRWA, *shėr'wa*, or TAMANDUA, *tâ·mân'dô-â:* lake of s.e. Africa, its n. end 30 m. s.e. of Lake Nyassa; lat. of centre 15° 10′ s., long. 35° 40′ e. It is of oval shape, tapering to the s.; length 60 m.; breadth 10 to 23 m.; 1,800 ft. above sea-level. It is surrounded by high land. On the w., between the lake and the river Shiré, Mt. Zomba rises 7,000 ft. Several small rivers enter the lake on the s. and w.

SHISDRA, *shĭs'drâ.* or JISDRA, *zhĭs'drâ:* town of European Russia, govt. of Kaluga, 80 m. s.w. from Kaluga, on the Shisdra, a branch of the Oka. It has manufactures of woolen cloth, glass-works, iron-works, tanneries, oil-factories. Pop. (1880) 11,703.

SHISHAK, *shē'shăk* (in hieroglyphs, Sheshenk, the Susak, or Susakim of the Septuagint, and the Shishak of the Hebrew version, the Sesonchosis or Sesonchis of Manetho): name of several monarchs of the 22d, or Bubastite Egyptian dynasty, supposed to have descended from foreign settlers in Bubastis, and to have been of Semitic origin. Notable among the kings of this name was S. I., first monarch of the dynasty, whose name is found in the portico built by the Bubastite dynasty at the great temple of Karnak, and on several statues of the goddess Pasht, which probably were brought from Luxor. The accession of S. I. is variously dated by Egyptologists; probably between B.C. 972 and 1015. Jeroboam fled to S. from the pursuit of Solomon, who wished to kill him, and lived there during the lifetime of Solomon. On Solomon's death Jeroboam quitted Egypt, and contended with Rehoboam for the crown, causing the division of the kingdom of David into two states, Israel and Judah. In the fifth year of Rehoboam, S. marched to Jerusalem with an army of 12,000 chariots, 60,000 cavalry, and an innumerable number of infantry, composed of Troglodytes, Libyans, and Ethiopians. He took the city, the treasures of the temple, and all the gold bucklers which Solomon had made. The conquest of Jerusalem is found recorded on the monuments of Karnak, on which S. I. is represented dragging before the god Ammon three files of prisoners, inscribed with various names of places, among which are Judæa, Mageddo, Ajalon, Mahanaim, and other towns taken by S. in his line of march.

SHITTIM, n. *shĭt'tĭm* [Heb. *shittah*, plu. *shittim*]: Species of wood of which the ark of the covenant, and the tables, altars, and boardings of the Jewish tabernacle, were made; probably the wood of some species of Acacia—perhaps the *Acācĭa seyal* or *Acacia vera*, or Shittah-tree, ord. *Legumĭnōsæ*, sub-ord. *Mimōsĕæ.* Some writers, however, refer the term to a species of Olive (*Olea similis*), whose wood is beautiful and durable.

Shittah-tree (*Acacia vera*).

SHIVE, n. *shīv* [Sw. *skifwa;* Icel. *skifa;* Dan. *skive*, a slice (see SHEAVE)]: slice or thin cut: little piece or fragment. SHIVES, n. plu. *shīvz*, circular disks of wood used as stoppers or bungs for casks instead of cork; corks for wide-mouthed bottles.

SHIVER, v. *shĭv'ėr* [dim. of SHIVE, a slice: Icel. *skifa;* Dan. *skive*, a thin slice: Icel. *skifa*, to cleave or split]: to break or fall into many pieces or splinters; to dash to pieces by a blow: N. a small piece or fragment of a thing broken by sudden violence; a species of blue slate. SHIV'ERING, imp. SHIV'ERED, pp. *-ėrd:* ADJ. shattered. SHIV'ERY, a. *-ėr-ĭ*, loosely coherent. SHIV'ERS, n. plu. *-ėrz*, the chips which arise from the dressings of building-blocks; in *geol.*, any loose sandy shale. SHIVER-SPAR, a carbonate of lime, so called from its slaty structure.

SHIVER, v. *shĭv'ėr* [Dut. *huiveren*, to shiver: Icel. *skialfa;* Dan. *skiælve*, to tremble]: to quake; to tremble; to shudder; to shake as from cold or fear: N. a shaking fit; a tremor; a shudder. SHIV'ERING, imp.: N. a trembling; a shaking with cold or fear. SHIV'ERED, pp. *-ėrd.* SHIV'ERINGLY, ad. *-ėr-ĭng-lĭ.* SHIV'ERS, n. plu. *-ėrz*, the ague.

SHIYAITES: see SHIITES.

SHOA, *shō'â:* kingdom of Africa, most southern division of Abyssinia; lat. 8° 30′—10° or 11° n., long. 38°—40° 30′ e. Its boundaries, however, are not fixed, its w. limit, where S. is bordered by the Galla tribes, being specially variable. An extensive tract in the e. of the kingdom, between the cap., Ankobar, and the river Hawash, is called Efat. For the character of the country, and condition of the people, see ABYSSINIA.

SHOAD, **n.** *shōd* [a corruption of Shed, to shake off, to scatter: Ger. *schutt*, rubbish; *schütten*, to shed, discharge]: broken ore mixed with rubbish, found by miners in searching for a lode, and which guides them to it. Shoading, or Shoding, n. *shōd'ĭng*, searching for fragments of ore in the gravel of a stream or valley with the view of tracing the vein from which they have been *shed* or dispersed. Shoad-stone, a detached fragment of ore.

SHOAL, n. *shōl* [AS. *scolu*, a company or multitude: Dut. *school*, a shoal of fishes, a flock of birds: Ir. *sgol*, a shoal of fishes]: a great multitude; a large crowd, applied to a vast number of fishes swimming together: V. to swim in vast numbers; to throng. Shoal'ing, imp. Shoaled, pp. *shōld*.

SHOAL, n. *shōl* [Ger. *scheel*, *schel*, oblique: comp. OF. *escueil;* It. *scoglio;* Sp. *escollo*, a shelf on the sea, or rocks under shallow water (see also Shallow)]: a shallow place in the sea or a river; a sandbank: V. to grow more shallow, applied to depth of water: Adj. shallow, as *shoal* water. Shoal'ing, imp.: Adj. filling up with shoals; becoming filled up with shoals. Shoaled, pp. *shōld*. Shoaly, a. *shōl'ĭ*, full of shallows. Shoal'iness, n. *-ĭ-nĕs* the state of being shoaly; want of depth of water.

SHOAR: see Shore 5.

SHOAT: see Shote.

SHOCK, n. *shŏk* [F. *choquer;* Sp. *chocar;* Dut. *schokken*, to jog, to knock against: Icel. *skykkr*, a jolt]: violent collision or onset; concussion occasioned by a collision; conflict of armed men; violence to the feelings; that which surprises or offends; impression of disgust; effect on the system produced by an accident, bad news, etc. (see Shock—Collapse—Reaction): sudden effect produced by the passage of electricity through an animal body: V. to shake by violence; to meet with hostile violence; to cause surprise or offense; to strike with horror or disgust; to offend highly; to cause to recoil, as from something disgusting or horrible. Shock'ing, imp.: Adj. causing surprise or offense; striking, as with horror; highly offensive; appalling; terrible. Shocked, pp. *shŏkt*. Shock'ingly, ad. *-ĭng-lĭ*.

SHOCK, n. *shŏk* [a corruption of Shag, which see]: a dog with long hair or shag, also called a *shock-dog;* a thick mass of short hair. Shock-headed, a. having thick and uncombed hair.

SHOCK, n. *shŏk* [O.Dut. *schocke*, a heap: Ger. *schock*, a quantity of sixty sheaves]: a pile of sheaves of wheat, oats, etc., set up on end in the harvest-field.

SHOCK—COLLAPSE'—REAC'TION: medical terms designating certain states of the bodily system which may result from sudden and violent injuries. It is well known that some forms of injury, e.g., a blow on the pit of the stomach, may occasion death without leaving any visible trace of their operation in the body; indeed, life may occasionally be destroyed by sudden and powerful mental emotions. In such cases as these, death is said to result from *shock*, the actual cause of death being sudden arrest of the heart's action, consequent on the violent disturbance of the nervous system. Instead of actual death, the condition known as *collapse* is more frequent, in which the patient lies in utter prostration, apparently on the verge of dissolution. The face, even the lips, are pale and bloodless; the skin is cold and clammy, and drops of sweat are often seen on the forehead. The features are contracted, and there is great languor in the general expression. There is extreme muscular debility, and the sphincter muscles sometimes relax, so that there is involuntary discharge of the contents of the bowels and the bladder. The pulse is quick, and so feeble as often to be almost imperceptible; and the respiratory movements are short and weak, or panting and gasping. The patient is in some cases bewildered and incoherent; in others drowsy, sometimes almost insensible. Nausea and vomiting, with hiccup, are frequent symptoms; and in children, convulsions are often present.

When a person recovers from collapse, he passes into a condition termed *reaction*, which often lasts several hours. The first symptoms of this favorable change are improvements in the state of the pulse and the respiratory actions, recovery of the power of swallowing, increased temperature, and inclination to move from the supine position to one side. A slight feverishness then often ensues, after which the skin becomes moist, the patient falls asleep, and awakes convalescent. As a general rule, the longer the symptoms of reaction are delayed, the greater is the danger; and if several hours pass without any sign of reaction, there is little hope of recovery. If the reaction is imperfectly developed, a condition may supervene known as 'prostration with excitement,' which may terminate either fatally or favorably, and of whose symptoms we have space only to remark that a peculiar delirium, closely resembling *delirium tremens*, is usually present.

The principal causes of collapse (see Holmes's *System of Surgery*) are:

'Injuries sudden and severe, or extensive, as contused and lacerated wounds, involving a considerable amount of texture—the crushing of a limb, for instance. Burns present familiar and striking examples of extreme collapse produced by this cause. Under this head, too, come capital operations. Injuries of very important organs, as the liver or other of the viscera, or of the joints, or other organs abundantly supplied with nerves. Pain alone, when intense and protracted, has proved fatal in this way; and it appears, in a case related by Sir A. Cooper, that sudden relief from great agony was attended by the same untoward result. Certain poisons operate in this manner, depressing the system so suddenly and severely as to produce a state of collapse; tobacco, for example; and drastic purgatives have in some cases induced a similar condition.'

The effects of shock are aggravated by loss of blood; and hemorrhage alone, if sudden and profuse, will produce collapse. General debility and old age favor the influence of the shock, and much depends on the idiosyncrasy of the patient; an injury which will produce no apparent effect on one man often producing a serious and persistent impression on another.

The following are the most important points in treatment: The patient should be kept in a horizontal position, with the head on the same level as the body, and he should not be raised till decided symptoms of reaction appear. The best stimulus is brandy, in the form of hot brandy and water: this best suits the stomach, and will remain when all other stimulants are rejected. But if no effects are apparent after an ounce or two has been swallowed, it is doubtful if any advantage will be gained from a larger quantity. At the same time, heat should be applied to the pit of the stomach and the extremities, by means of hot flannel, hot-water tins, or, in their absence, bottles containing hot water, and other appliances. Nourishment, in the form of beef-tea, should closely follow the stimulants; the two may be combined with great advantage, and as the system rallies, the stimulant may be entirely replaced by the nourishment.

In those cases in which a patient is in extreme collapse from an injury requiring a capital operation, such as the amputation of a limb, the operation should be performed as soon as his condition will admit; and though it should not be undertaken while the prostration is extreme, good authorities deem it not necessary or even advisable to wait for complete reaction. Moreover, in these cases, the use of chloroform is not expedient: for, in the first place, it cannot be safely administered to a patient so depressed; secondly, the chief reason for its employment is wanting, for a person in collapse is comparatively insensible to pain. —See further, Travers *On Constitutional Irritation*, and the article by Savory, quoted above from Holmes's *System of Surgery*.

SHOD, v. *shŏd:* pt. pp. of Shoe, which see. Shod'dy, a. of a trashy or inferior character; pretentious; not genuine; sham.

SHODDY, n. *shŏd'dĭ* [from Shed 3, which see]: formerly the flue or fluff *shed* or thrown off from cloth in the process of weaving; now, the wool of woven fabrics reduced to the state in which it was before being spun and woven, and thus rendered available for remanufacture: also, an inferior woolen cloth, made from a material consisting of old woolen goods torn to shreds, and new wool in varying proportions; in the United States, a textile fabric of any description of inferior or fraudulent character. Woolen rags, however old and worn, are now valuable to the manufacturer; they are sorted into two special kinds, rags of worsted goods and rags of woolen goods, the former being made of *combing* or long-staple wools, the latter of *carding* or short-staple wools. The worsted are those properly known as *shoddy*-rags and the woolen are called *mungo*. Both are treated in the same way; they are put into a machine called a *willey*, in which a cylinder covered with sharp hooks is revolving, and the rags are so torn by the hooks that in a short time all traces of spinning and weaving are removed, and the material is again reduced to wool capable of being reworked. S. was used formerly in adulteration and cheapening woolen cloths, but it is now found of greater advantage for making a class of light cloths adapted for mild climates, and other purposes. See Woolen Manufactures.

SHOE, n. *shō*, plu. Shoes, *shōz* [AS. *sceo;* Goth. *skohs;* Dut. *schoen;* Icel. *skor;* Ger. *schuh*, a shoe: akin to Skr. *sku*, to cover]: a covering for the foot, usually of leather, and consisting of a sole and an upper (see Shoes; and Shoe-manufacture); rim or plate of iron fastened on the bottom of a horse's hoof for protection: bend or crook at the bottom of a water-pipe which discharges the water from a building: a sort of drag placed under the wheel of a loaded vehicle on going down a steep part of a road: in *mech.*, a notched piece on which something rests: a kind of trough: V. to fit the foot with a shoe; to furnish with shoes. to cover at the bottom. Shoe'ing, imp.: N. the act of one who shoes; the putting on of shoes. Shod, pt. pp. *shŏd*, did shoe. Shoer, n. *shō'ėr*, one who shoes horses. Shoe'less, a. *-lĕs*, without shoes. Shoe-black, one who cleans shoes. Shoe-leather, leather for shoes. Shoemaker, one who makes shoes. Shoe-tie, or Shoe-latchet, that which fastens a shoe; shoe-string. Shoeing-horn, a long concave piece of horn, ivory, metal, etc., which, by being placed between the heel of the foot and the back leather of the shoe, facilitates the insertion of the foot into the shoe. In another man's shoes, occupying the place or possessing the honors of another.

SHOEBURYNESS, *shō'bėr-ĭ-nĕs:* town in England, on the coast of Essex, at the mouth of the Thames, facing the Nore. A school of gunnery is here, with artillery barracks, batteries, targets, and other appliances for experimenting on cannon.

SHOE'ING OF HORSES: see Horse-shoeing.

SHOES; AND SHOE-MANUFACTURE: outside coverings for the feet; and the art of making them. Foot-covering, whether in the form of sandals or shoes, has been in use in every country aspiring to civilization in ancient and modern times. The rudimentary shoe is a sandal consisting of a sole, held to the foot by straps and thongs, as in fig. 1. Such were the common Egyptian and Greek shoes, to which the shoes of the peasantry of the Abruzzi, in s. Italy, bear close resemblance. In Egypt, however, the ordinary materials for shoes were strips of the papyrus interwoven like a mat; an example of a sole of this kind is in fig. 2. As is seen from paintings on the walls of Thebes, shoemaking formed a distinct trade in the reign of Thothmes III., B.C. 1495, or about the period of the flight of the Israelites. In fig. 3 a sketch is presented from Thebes of two Egyptian shoemakers at work, with the tools of their profession beside them. The streets of Rome were encumbered with the stalls of shoemakers in the reign of Domitian. The shoe of the ancient Hebrews was a species of sandal. For ladies, the sandal, translated 'shoe' in the Scriptures, was highly ornamental: 'How beautiful are thy feet with shoes, O prince's daughter' (Cant. vii. 1). Ornamented slippers are still a luxury in the East. The foot-coverings of the Romans were various in character, from the simple sandal and slipper to the boot, which extended up the leg. When the shoe covered the whole foot, it was termed *calceus;* the calceus of a particular form and of great strength worn by the Roman soldier was known as *caliga.*

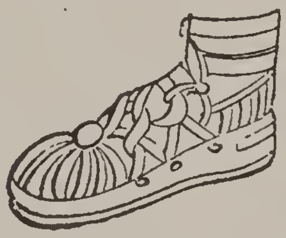


Fig. 1.

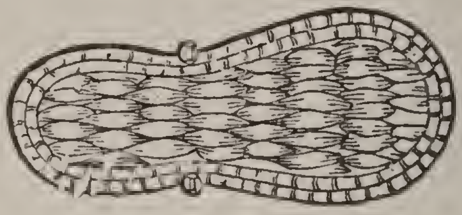


Fig. 2.

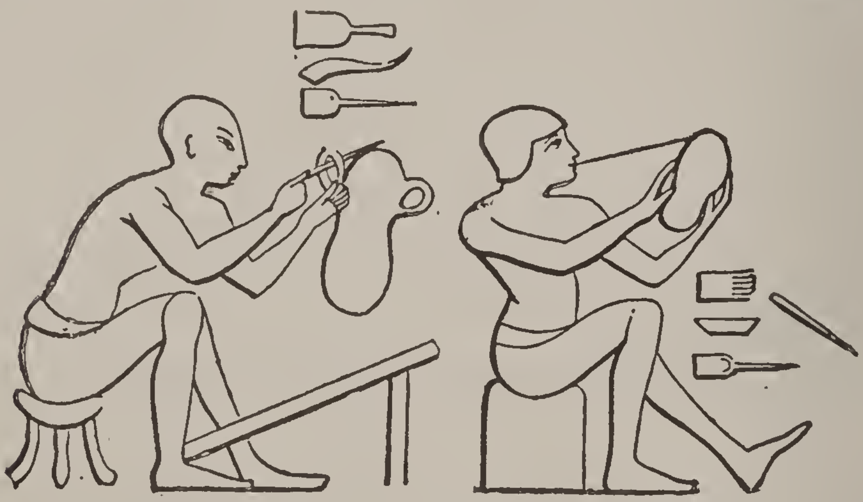


Fig. 3.

SHOES AND SHOE-MANUFACTURE.

Reference is made in Scripture to different symbolical usages in connection with sandals or shoes. The delivery of a shoe was used as a testimony in transferring a possession: 'A man plucked off his shoe, and gave it to his neighbor: and this was a testimony in Israel' (Ruth iv. 7). In cases of this kind, the throwing of a shoe on a property was a symbol of a new proprietorship or occupancy: 'Over Edom will I cast my shoe' (Psalm lx. 8). From these ancient practices, in which the shoe was symbolical of contract, perhaps comes the curious old custom in England and Scotland of throwing old shoes for good luck after a bride and bridegroom on departing for their new home.

St. Crispin and his brother Crispinian have long been regarded as the patron saints of shoemakers. According to mediæval legend these personages were natives of Rome, and having become converts to Christianity, travelled into France and Britain to propagate the faith, everywhere supporting themselves by making shoes, which they sold to the poor at a very low price—one part of the legend being that an angel supplied them with leather. It is said that they suffered martyrdom in England toward the end of the 3d c. The memory of St. Crispin, of whom chiefly we hear, has from time immemorial been kept up by processions and other festivities in his honor on Oct. 25, 'St. Crispin's Day.' Under this saintly tutelage, shoemaking has attained the distinctive appellation of the 'gentle craft'; and is noted for the number of individuals who have risen from it to eminence. See an amusing but scarce work, *Crispin Anecdotes;* and a trade newspaper called *St. Crispin.* The sedentary and solitary nature of the craft, as formerly conducted, has possibly had some influence in producing a degree of thoughtfulness; while the act of hammering his leather is calculated, as some imagine, to stimulate the mental energy of the operative. If there be any real virtue in the sitting attitude of the shoemaker, a corresponding evil attends that method of carrying on his operations; for in every profession, sitting at work in a close atmosphere is injurious to health. Statistics assure us that out of 10,000 artisans who sit at their labor, 2,577 fall sick, and 95 die annually; while as regards an equal number of those who alternately sit and stand, only 1,713 sicken, and 61 die. As a remedy a simple and inexpensive work-bench has been invented at which shoes may be made standing: the only kinds of work in which sitting is more convenient are rounding the soles, lasting, and fitting.

The fashion of shoes, as of other articles of dress, has undergone innumerable changes. At one time, shoes were pointed to an extravagant degree; and in the 18th c., the high heels of ladies' shoes became a monstrosity. Shortly after the beginning of the 19th c., the most marked improvement was the making of shoes right and left; the substitution of latchets for buckles about the same period also was a step in advance. In our own day, a large disuse of the low shoe, and the introduction of high shoes, really short ankle-boots, are the chief changes of fashion. For a proposed nearer adaptation of shoes and boots to the shape of the foot, see FOOT. Till within recent years the usage has been for customers desiring good shoes to order them and have them made to measure; but the buying of shoes ready-made has now become common. The cause of this is obvious: the process of measuring is usually very imperfect, owing, among other reasons, to lack of lasts to suit every variety of feet, as well as indifference or lack of skill to meet individual peculiarities. Accordingly, immense quantities of boots and shoes, in innumerable varieties and in all sizes and shapes, are now made and supplied wholesale by manufacturers for the retail dealers.

The system of making boots and shoes by isolated workmen at their own homes, has been found incompatible with the modern necessities of trade. As in the case of the handloom weaver, the shoemaker of the old school has had to succumb to machinery. After an unsuccessful struggle to oppose the introduction of sewing-machines in this manufacture these are now coming generally into use, and men and women are employed in large numbers together in shoe factories.

This manufacture has long been a staple trade in Mass., where boots and shoes are made by millions of pairs annually. A machine, invented in Salem, Mass., has been introduced for fixing the soles to the uppers by means of pegs: a pair of boots or shoes can be pegged in two minutes. These pegged goods are disposed of wholesale in boxes, and are found in retail stores all over the country. As evidence of the important character of the shoe-trade in Mass., it may be mentioned that a few years ago there were as many as 15 members of the 'gentle craft' in the legislature of that state. Ingenious machines have also been introduced for fastening the soles to the uppers by fine screws.

In 1890 there were in the United States 2,082 boot and shoe factories, working exclusively in leather, and distinct from custom and repair shops. These factories had combined capital $95,282,311 ; employed 139,333 persons ; paid $66,375,076 wages. These employees were subdivided as follows : males, above 16 years of age, 48,919 pieceworkers, 42,487 operatives ; females, above 15 years of age 23,908 pieceworkers, 15,941 operatives ; children, 1,858 operatives, 577 pieceworkers. The total number of pounds of sole leather used (1890) was 144,035,401 ; split leather 20,876,708 ; calf and kipskins 18,486,417 ; and of goatskins 142,340,532 feet were used ; cowhide 48,527,089 feet ; all other upper leather 116,552,432 feet. The materials cost $118,785,831, and the products were valued at $220,649,358. Total number of pairs of boots and shoes produced was 173,862,940, of which 106,122,451 were for women and girls.

For the cutting of boot and shoe stock there were 344 establishments ; having as capital $5,401,834 ; employed 5,503 persons ; paid wages $2,323,271 ; materials $13,744,655 ; value of product $17,903,846 For boot and shoe findings there were 138 establishments ; with $1,793,123 capital; persons employed 2,283; paid wages $771,937; materials $1,965,173; products $3,459,328. For boot and shoe uppers there were 317 establishments; with $1,216,026 capital; employed 1,708 persons; paid wages $898,336; materials $1,902,926; products $3,346,002. For custom and repair work there were 20,803 establishments; having capital $14,230,081; employed 35,448 persons; paid wages $16,750,729; materials $10,403,383; products $34,856,651. Combining these branches of leather boot and shoe manufacture, the condition of the industry (1890) was: 23,684 establishments; $17,923,375 capital; 184,275 persons employed; $87,119,349 paid in wages; $146,801,968 materials; and $280,215,185 products. For the manufacture of rubber boots and shoes there were 11 establishments; $17.790,970 capital; employed 9,264 persons; paid wages $3,966,875; materials $11,650.787; products $18.632,060. The following states were chief producers: Mass., with 1,057 estab. produces goods valued at $116,387,900; N. Y., 257 establishments; value of products $23,661,204; Penn., 158 estab.; value of products $10,354,850; N. H., 64 establishments; value of products $11,986,003. The increase in the industry 1880-1900 was unquestionably very large. In 1900 there were reported 992 boot and shoe manufacturing establishments, employing $57,340,478 capital and 84,835 persons; paying $35,541,670 for wages, $95,259,912 for materials used, and $6,799,439 for miscellaneous expenses; and yielding products valued at $151,813,904.

SHOG, v. *shŏg* [Swiss, *schaggen*, to jog: W. *ysgog*, a jolt; *ysgogi*, to wag (see Shock 1)]: in *OE.* and *Scot.*, to jog or joggle; to move off; to agitate by sudden interrupted impulses; to shake: N. a violent concussion. Shog'ging, imp. Shogged, pp. *shŏgd.* Shoggle, v. *shŏg'gl*, to shake; to joggle. Shog'gling, imp. *-glĭng.* Shog'gled, pp. *-gld.*

SHO'GOON: see Shogun.

SHOGUN, n. *shō'gûn* [Japanese, generalissimo]: the so-called 'secular' emperor of Japan; in reality the governor and generalissimo of that country, or the military governor or commander-in-chief, the mikado being the real emperor or king.

SHOLA, *shō'lâ:* white pith of the leguminous plant *Æschynomene aspera*, native of the E. Indies. With this substance, which is exceedingly light, the natives of India, make a great variety of useful articles, especially hats, which being very light and cool are in great request. Helmets of shola are much used by Brit. troops in India.

SHONE, v. *shōn* or *shŏn:* pt. pp. of Shine, which see.

SHOO, or Shue, v. *shô:* to scare off, as birds from corn. Shoo'ing, imp. Shooed, pp. *shôd.*

SHOOK, v. *shûk:* pt. of Shake, which see.

SHOOK, n. *shûk* [from Shock 3, which see]: a set of staves sufficient to make one cask or hogshead, or a set of boards sufficient to make a sugar-box, prepared or fitted for putting together: whalers carry out the staves and headings for oil-casks ready prepared in shooks, and put them together on board as the catch of fish requires: furniture made in parts and not set up, but shipped in packs. Shook, v. to pack in shooks.

SHOON, *shûn:* in *OE.* and *Scot.*, plu. of Shoe.

SHOOT, v. *shôt* [Icel. *skjota;* Swed. *skjuta;* Dut. *schieten;* Dan. *skyde;* Ger. *schiessen;* AS. *sceotan*, to dart, to shoot]: to let fly or discharge anything with such force as to cause it to pass swiftly through the air; to send off with sudden force; to be emitted; to move swiftly along; to dart; to discharge, as from a gun; to maim or kill by letting off a gun; to penetrate, as words; to perform the act of shooting; to pass, as an arrow or a ball; to throw or send out, as a branch; to thrust forth, as the lips; to bud or sprout; to grow rapidly; to discharge, as earth or rubbish from a cart, etc.; to pass quickly over or under, as a rapid or a bridge: N. a young branch issuing from the main stock; an inclined plane down which timber, coal, etc., are caused to *shoot* or slide; a narrow passage in a river through which the water rushes rapidly; among *miners*, a vein running in the same direction as the strata in which it occurs. Shoot'ing, imp.: N. act of using a gun or bow; the act or practice of killing game with firearms; sensation of a quick darting pain: Adj. moving rapidly, as an arrow from a bow, or a ball from a gun; quick and darting. Shot, pt. pp. *shŏt.* Shooter, n. *shôt'ėr*, one who shoots; an archer. To shoot ahead, to outstrip in running, flying, or sailing. Shooting-star, a meteor in a state of combustion, seen suddenly darting across some part of the sky. Shooting-box, a small house in the country for use in the shooting season. Shooting stick, among *printers*, a tapering piece of wood or iron used in driving up the quoins in the chase. Sharpshooter, in *mil.*, a skirmisher sent out in front of a body of troops to annoy and pick off with his rifle individuals of the enemy's force. To shoot a bolt, to make a bolt secure within its fastenings.

SHOOTING-STARS: see Aerolite: Meteor.

SHOP, n. *shŏp* [OF. *eschope*, a stall or little shop: Ger. *schoppen*, a shed: AS. *sceoppa*, a stall: Icel. *skapr;* Dan. *skab*, a press or cupboard]: a place in which goods are sold by retail; a building in which mechanics work; a store; a warehouse: V. to visit shops for the purchase of goods. Shop'ping, imp.: N. the act of visiting shops for the purchase of goods. Shopped, pp. *shŏpt.* Shop-like, a. vulgar; savoring of petty dealing. Shop-bill, a tradesman's business announcement. Shop-board, a bench on which work is performed. Shop-book, a book in which a tradesman enters his sales on credit. Shop-keeper, a trader who sells goods by retail in a shop. Shop-lifter, one who, under a pretense of buying, steals from shops. Shoplifting, n. stealing from a shop. Shop-man, one who serves in a shop. Shop-walker, in a *large shop*, an attendant who directs customers to the proper department and who sees that they are duly attended to. To talk shop, to use phrases and manner of speech peculiar to one's employment or profession.

SHORE, n. *shōr* [Dut. *schore,* a tearing, a rent: Low Ger. *schoren,* to tear asunder: AS. *sceran,* to shear]: the land adjacent to a sea or ocean, or to a great lake or river (see SEASHORE). SHORED, a. *shōrd,* having a bank or shore. SHORE'LESS, a. *-lĕs,* of indefinite or unlimited extent. SHORE'WARD, ad. *-wėrd,* toward the shore. SEASHORE, the space between high and low water marks; the beach.

SHORE, n. *shōr* [Ger. *scharren,* to scrape: Swiss, *schoren,* to cleanse, to sweep out stables: Eng. *shoreditch,* being the ditch which receives the scrapings of the streets: erroneously supposed to be a corruption of *sewer*]: a public drain—see Wedgwood.

SHORE, v. *shōr:* pt. of SHEAR, which see.

SHORE, *shōr,* JANE: notorious woman of the 15th c. The chronicles are silent with regard to the time both of her birth and her death. She was the wife of one Shore, goldsmith, of London, but became one of the concubines of King Edward IV., whose favor, says Sir Thomas More, 'she never abused to any man's hurt, but to many a man's comfort and relief.' Her power of captivating lay no less in her wit and sprightliness than in her beauty of form or features. After Edward's death, S. was mistress of Lord Hastings. Hastings having been beheaded for treason 1483, the protector of the kingdom, Duke of Gloster (afterward Richard III.), had S. imprisoned as a sorceress, and confiscated all her belongings, which were valued at a considerable sum. By the judgment of the bp. of London S. was required to do public penance. She was afterward mistress of the Marquis of Dorset. Later she so captivated the king's solicitor, Thomas Lynom, that he sought to marry her. She was still alive 1513.

SHORE, n., or SHOAR, n. *shōr* [Norw. *skora;* Icel. *skorda,* a prop or shore: Dut. *schoor,* a prop]: a support: one of the stocks or strong props by which a ship is supported on dry land, or by which a wall or building is temporarily supported: V. to support with a prop or buttress temporarily. SHOR'ING, imp.: N. the act of supporting with props or shores; a number or system of props. SHORED, pp. *shōrd.*

SHORE'DITCH: see TOWER HAMLETS.

SHOREHAM, *shōr'am,* NEW: seaport in the county of Sussex, England, at the mouth of the Adur, six m. w. of Brighton. The town arose when the harbor of Old Shoreham, now a mile inland, became silted up. Shipbuilding is carried on here on an extensive scale, and the trade of the port is considerable, principally with France and the coast. There entered the port (1880) 802 vessels, of 90,721 tons; cleared 817 vessels, of 91,683 tons. About 160 vessels belong to S., many of which are employed in the oyster-trade.—Pop. parish (1881) 3,753; (1891) 3,393.

SHORL, n. *shŏrl:* another spelling of SCHORL (q. v.).

SHORLING, n. *shŏr'lĭng* [from *shore,* pt. of *shear*]: in *Eng.*, the skin of a living sheep after shearing: *morling,* the skin taken from a dead sheep.

SHORN, v. *shŏrn:* pp. of Shear, which see.

SHORT, a. *shŏrt* [AS. *sceort;* OHG. *scurz;* Icel. *kortr;* Ger. *kurz;* L. *curtus*, short]: not long; not long either in space or time; inadequate; insufficient; imperfect; breaking or crumbling readily; crisp; brittle, as iron; not bending; brief; concise; quick; sudden; abrupt; angry; not going so far as intended: Ad. not long; quickly; insufficiently: N. a summary or concise account, as in the phrase, 'the *short* and long of the matter is;' a word often given as a reply at the counter of a bank when the amount of a check is desired in a small compass. Shorts, n. plu. the part of ground grain sifted out somewhat finer than bran. Short′ly, ad. *-lĭ*, soon; briefly. Short′ness, n. *-nĕs*, the quality of being short; conciseness; deficiency. Short allowance, less than the usual or regular quantity served out, as the allowance to sailors, soldiers, etc., during a protracted voyage, march, siege, or the like, when provisions are likely to be scarce. Short-breathed, *-brĕtht*, having a short quick respiration. Short cake or bread, bread baked of flour and butter that breaks easily and crisply. Shortcoming, a failing of the usual produce or quantity; a failure in duty. Short-commons, n. a short or scanty allowance of food. Short-dated, having little time to run, as a bill of exchange. Short-drawn, being of short breathing; imperfectly inspired. Short-exchange, n. in *com.*, the rate of exchange quoted in the market for bills payable 10, 20, 30, or more days after sight. Shorthand, a rapid system of writing by means of contractions and simple characters (see below). Shorthand-writer, one who professionally takes notes in shorthand; a reporter. Shorthead, among *sailors*, a sucking whale less than a year old. Short-lived, not living or lasting long. Short rib, one of the lower ribs; a false rib. Short-sighted, a. not able to see distant objects; not able to see far intellectually; imprudent. Short-sightedness, n. a defect in vision (see Sight, Defects of): defective or limited intellectual sight. Short-spoken, speaking in a quick short manner; gruff. Short-waisted, short from the armpits to the waist. Short-winded, affected with shortness of breath. Short-witted, having but little wit; of scanty intellect. At short notice, in a brief time; promptly. In short, in a few words; briefly. The long and short, the whole. The shorts, on the *stock exchange*, the dealers who are deficient in those stocks at the time they have undertaken to deliver. To cut short, to abridge; to stop suddenly. To fall or come short, to fail; not to do or accomplish. To sell short, on the *stock exchange*, to sell for future delivery what the dealer has not in his possession at the time of contract, but which he hopes to purchase at a lower rate. To stop short, to stop at once, or without reaching the point aimed at. To turn short, to turn abruptly.—Syn. of 'short, a.': brief; laconic; concise; succinct; summary; limited; inadequate; insufficient; wanting; scanty; lacking; defective; imperfect; narrow; abrupt; contracted; pointed; petulant; severe; crisp; brittle; friable.

SHORT, CHARLES, LL.D.: educator: 1821, May 28—1886, Dec. 24; b. Haverhill, Mass. He graduated from Harvard Coll. 1846; taught in Andover, Mass., Roxbury, Mass., and Philadelphia 1847–63; pres. of Kenyon Coll. 1863–67; and prof. of Latin in Columbia Coll. 1868 till his death, succeeding Prof. Drisler. He was a painstaking and original writer, and besides contributing critical articles to the *Bibliotheca Sacra* and other reviews, he edited Schmitz and Zumpt's *Advanced Latin Exercises*, revised Mitchell's *Neu Ancient Geography* and Andrews's Freund's *Latin Dictionary*, and wrote an essay *On the Order of Words in Attic Greek Prose.* He was sec. of the Amer. committee for revision of the New Test. and member of several learned societies.

SHORT, WILLIAM; diplomatist: 1759, Sep. 30—1849, Dec. 5; b. Spring Garden, Va. He was educated at William and Mary College, and began his diplomatic career as sec. of legation when Thomas Jefferson was minister to France 1785, and was chargé d'affaires after Jefferson left Paris. He became minister-resident at the Hague 1792, but left the same year for Madrid as commissioner plenipotentiary to adjust the Fla. and Miss. boundaries, the navigation of the Mississippi, and commercial relations with Spain. He was commissioned minister-resident 1794, and the next year concluded with Spain an important treaty of commerce and boundaries.

SHORTEN, v. *shŏrt'n* [from SHORT, which see]: to make short; to lessen; to abridge; to contract; to become short. SHORT'ENING, imp. *-nĭng:* N. a making short or shorter; anything used, as butter or lard, to make pastry crisp. SHORT'ENED, pp. *-nd.* To SHORTEN A ROPE, to take in the slack of it. To SHORTEN SAIL, to reduce sail by taking the sails in.

SHORTHAND: a system of rapid writing, the process of which is so abbreviated as to keep pace with speech; also known according to the principal underlying the particular system as tachygraphy (quick writing), brachygraphy (short writing), stenography (compressed writing), and phonography (sound writing). It was practiced by the ancient Greeks and Romans, not only on account of its brevity, but for purposes of secrecy; but all knowledge of the art was lost from the tenth century until the end of the sixteenth, when modern shorthand had its birth in the publication by Dr. Timothy Bright of his *Characterie* (1588) and by Peter Bales of his *Arte of Bracrygraphie* (1590). In these early systems arbitrary signs were used in most cases to denote each word. The earliest system of shorthand of any practical importance was that of John Willis, whose *Arte of Stenographie* (1602) became more or less popular. It was based on the common alphabet with the addition of arbitrary signs. This was the first real stenographic alphabet for shorthand, and a decided advance beyond Bright. The advance, indeed, was such, that the author sincerely believed he had reached the goal, in spite of the many drawbacks in the cumbrous letters, and in the large omissions necessary to secure any degree of brevity, and the still larger number of indispensable arbitraries. His confidence shows itself in the description of his latest edition, where he says: "It is now twenty-one years since first was published this art of stenography, being the first book of spelling characterie that ever was set forth; since which time many others, taking their fundamental rules from this book, have sought to better the invention by changing the figure, power, or places of the literal characters, and by the various affixing of them one to another. Howbeit, I am confident in this persuasion, that as this art of stenography was the first that ever gave direction for any form of spelling characterie, so it shall continue the last, and wear out all the aberrations thereof published, or taught by any other." However thankful we may be for the one progressive step made by John Willis, we are still more thankful that his prediction was not fulfilled, and that the art did not stand still where he said it would. Even during his lifetime, a namesake of his, Edmond Willis, had announced a device which when fully developed later, came to be of great service and has continued to be to the present day; viz., that of separating the vowels from the consonants, and placing them around the strokes in different positions, so that they might be written or not according to need and opportunity. Among Willis's imitators were T. Shelton, whose system (1620) was used by Samuel Pepys, and that of Jeremiah Rich, whose system (1646) was commended by Locke. Rich's system was improved by William Mason (1672), the best shorthand writer of the seventeenth century, and Thomas Gurney published his *Brachygraphy,* founded on Macon's system in 1751 Mr. Gurney obtained an appointment from the government as its shorthand writer—an appointment that has descended with the Gurney family to the present day, though a large proportion of their staff (shorthand writers to the Houses of Parliament) now use the Isaac Pitman system. In 1767 appeared the *Universal English Shorthand* of John Byrom, an a, b, c, system characterized by "simple strokes and no arbitrary characters," and in 1780 was published an improvement of Byrom's system by William Mavor, Samuel Taylor published his *Stenography* in 1786. This, which is considered the best of all the a, b, c system, contributed largely to make stenography popular, and it was the system which was almost universally used until Isaac Pitman invented and gave his Phonography to the world in 1837, a system so practical and scientific that it has merited distinction above all others in public estimation. In comparison with Gurney's system, Taylor's system possessed more easy and natural outlines, and is therefore capable of being written with a great degree of speed. Like Byrom, Taylor discarded arbitrary characters altogether; but Harding, who re-edited his system in 1823, introduced a few. It is instructive to compare the alphabets of these early inventors, and note the gradual improvement made in the one particular of alphabetic signs. If many modern inventors had carefully noted the attempts of these older times in the way of constructing alphabets, they would probably have been spared much hard labor and disappointment, and their deluded followers would have received like benefit.

The two qualities essential to good shorthand, whatever else may assist, are (1) Brevity, in order to secure rapidity in writing; and (2) fullness sufficient to make the writing legible. Should brevity be wanting, the purpose of shorthand is not met; and if the writing should prove illegible through too great brevity or any other cause, it is equally useless. By examining the above systems representative of this era of nearly three hundred years, a gain in the direction of brevity, so far as the alphabets are concerned, is evident; and at the same time the characters being as varied and significant as the Roman characters, the writing retains its legibility. When other gains are also taken into account, such as better joinings of letters, omitting silent letters, the gradual adoption of a phonetic principle, pairing of letters according to sound, using distinct signs for combinations of consonants and for syllables, substituting written words for arbitrary signs;—taking all theses into account the improvement, though slow, is very manifest.

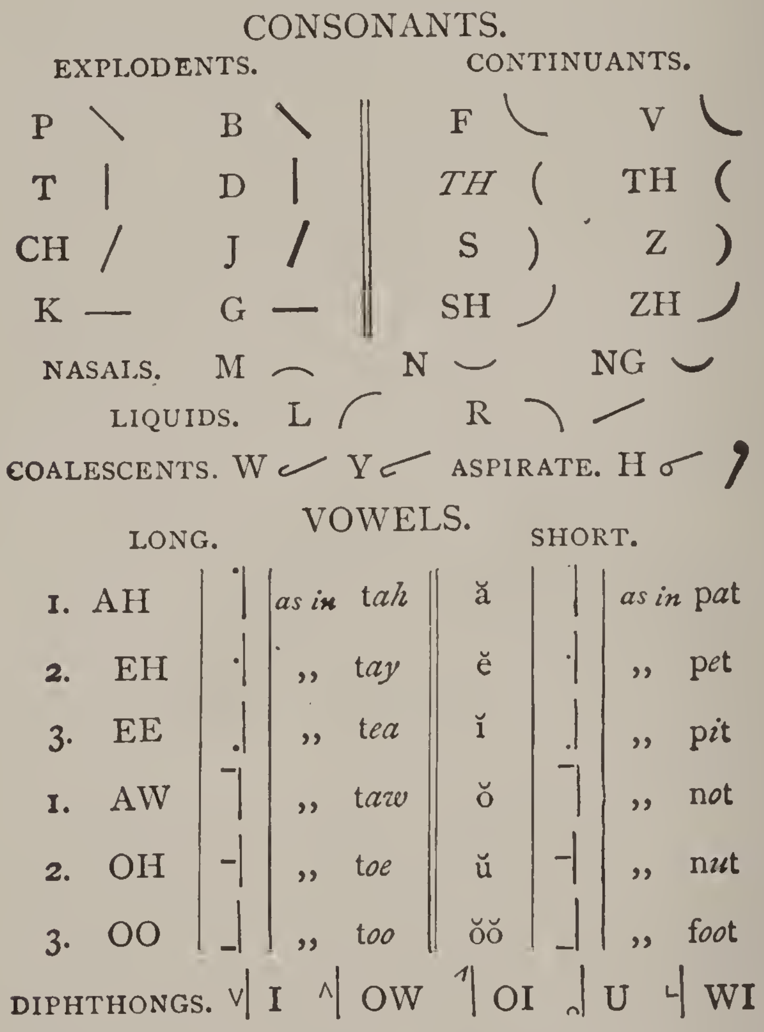
As will be seen, Isaac Pitman had a number of predecessors, whose systems, like his own, were strictly phonetic. The best known modifications in the United States of the original Isaac Pitman phonography are, the Benn Pitman (1855), the Graham (1858), and the Munson (1868). Like all other phonetic systems, Pitman's rejects the ordinary orthography, and writes words according to their sounds; thus, though becomes *tho; plough* becomes *plow;* enough becomes *enuf.* Discarding the common alphabet, which formed the basis of the stenographic systems, it has adopted an alphabet of its own, consisting of straight lines, curves, dots, etc., each representing a distinct sound. This alphabet is the basis of a highly ingenious and perfect system, which aims at securing the greatest degree of brevity consistent with legibility, and this end it endeavors to obtain by a variety of devices, forming integral parts of the system. Isaac Pitman did not reach this point of perfection all at once, but it has been reached by test after test, not on his own part only, but on the part of the most expert and experienced reporters over the English-speaking world, whose aid the inventor had invited and thankfully accepted for more than half a century.

SHORTHAND.

Following is shown (by permission) the Isaac Pitman alphabet as presented in the Twentieth Century edition of the *Shorthand Instructor,* a recognized textbook in the leading schools and colleges:

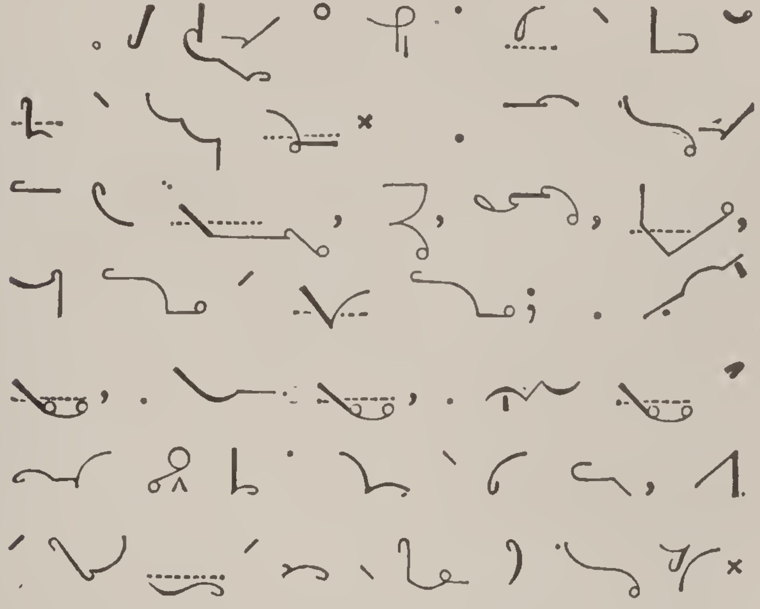
THE PHONOGRAPHIC ALPHABET.

(BY ISAAC PITMAN.)

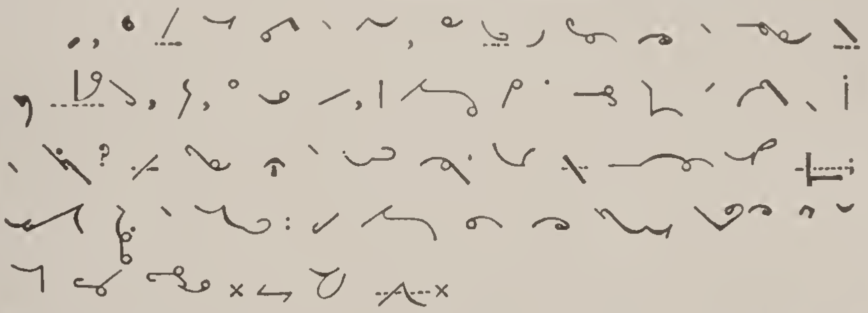


Shorthand in Public Schools.—The great impetus towards practical education since 1890 has created new demands. This activity is manifesting itself in the establishment of business departments in normal and high schools. In this connection it is interesting to note that the new course of study inauguated September, 1903, by the New York Board of Education, includes the subject of phonography during the eighth year. In 1887, the Tercentenary of the origination of modern shorthand by Timothy Bright and the jubilee of Isaac Pitman's phonography were celebrated by the holding of the first International Shorthand Congress in London. In 1882-6 Thomas Allen Reed, A. J. Lawson, and J. R. Bruce, adapted Isaac Pitman's shorthand to the French language.

In rapid writing in Pitman's system the vowels are generally omitted, as will be seen in the following examples, the first being in the easy reporting style, and the second in the condensed or brief style.



TRANSLATION OF ABOVE.—The general development of the country has necessitated a style of education not dreamed of fifty years ago. The commercial affairs of the country call for book-keepers, cashiers, stenographers, typewriters, entry clerks and bill clerks; the railroad business, the banking business, the importing business and the mercantile houses demand an army of well equipped, ready and proficient young men and women to transact their affairs intelligently.



Key.—Who, that is much in the habit of writing, has not often wished for some means of expressing by two or three dashes of the pen, that which, as things are, it requires such an expenditure of time and labor to commit to paper? Our present mode of communication must be felt to be cumbersome in the last degree; unworthy of these days of invention: we require some means of bringing the operations of the mind and of the hand into closer correspondence.—*English Review.*

Stenography in Germany.—From the middle of the seventeenth century until 1832, there was no system of stenography capable of taking a full reliable not of any public or private speech. Franz Iaver Gabelsberger (1789-1849) in 1817 commenced to construct his system, but it was fifteen years before he found a publisher. Like other inventions it was at first crude, but subsequent editions contained improvements which entitled it to first rank of all systems in Germany. The Prussian Chamber is the only exception to the official use of the Gabelsberger Shorthand in Germany. A statue of Gabelsberger was unveiled at a Shorthand Congress in Munich in 1890. The next in importance among the German shorthand authors is Henri Guillaume Stolze, 1798-1867. He has many followers, but wherever Governmental Committees have been appointed to look into the subject they have invariably reported in favor of Gabelsberger. The next place is given to Dr. Leopold Arends of Berlin (1860) and the fourth to Auguste Lehman (1875). In Italy, Signor Giuseppe Francini, of Rome, is devoting his life and means to the advancement of phonography, on the general Pitmanic basis as against the "cursive systems, so-called, of the customary continental stenographies. In the preparation of this article the following works of reference have been used; Isaac Pitman's *History of Shorthand;* John Westby-Gibson's *Bibliography of Shorthand;* Thomas Allen Reed's *Biography of Isaac Pitman;* the *Phonetic Journal,* 1842-1903; J. E. Roekwell's *Shorthand Instructioin and Practice,* and the *Shorthand Instructor.*

SHORT'HOUSE, Joseph Henry: author; b. Birmingham, England, 1834. His most famous book is *John Inglesant,* historical romance (1881). Besides this he has written *The Platonism of Wordsworth* (1881); *The Little Schoolmaster Mark* (1885); *Sir Percival* (1886); *A Teacher of the Violin, and Other Tales* (1888); *The Countess Eve* (1888); and prefaces to George Herbert's *Temple* and Molinos's *Spiritual Guide.*

SHOSHO'NE (or Snake) River: see Idaho.

SHOSHONES, *shō-shō'nēz,* or Snakes: tribe of Indians found between the Sierra Nevada and Rocky Mts. from Ida. s. into Utah. They comprise the S. proper, the Utes, and according to some authorities the Comanches, Moquis, and other tribes. The S. proper have been separated into several bands, among which are the Koolsatikara or Buffalo Eaters, the Tookarika or Mountain Sheep Eaters, and the Shoshocos or White Knives. They were for many years engaged in defensive warfare with the neighboring Crows, Blackfeet, Cheyennes, and Arapahoes; but have lived in comparative peace with the whites, though there have been outbreaks, and a number of treaties have been made with them. The s. S. subsist on roots and small animals, while the n. tribes hunt larger game and procure abundance of fish from the rivers. They dress in buffalo and deer skins, live in skin huts, and little has been done for their education or religious training. The Bannack are sometimes classed separately, but occupy the same reservations, and are closely allied. In 1890 there were 383 S. in Nevada; 916 in Wyo.; 1,493 Bannacks and S. at the Fort Hall agency, Ida. (979 S.), considered one tribe from intermarriage; and 432 Bannack, S., and Sheepeaters at the Lemhi agency, Ida. (249 S.), all speaking the Shoshone language.

SHOT, n. *shŏt* [from SHOOT, which see]: act of shooting; balls or bullets for firearms (see below); globules of lead for killing birds or small animals: the flight of a missile, or the distance over which it passes: a shooter; a marksman, as a good or bad *shot:* in *Scot.*, among *fishermen*, the whole sweep of nets thrown out at one time; the draught of fishes made by a net; *familiarly*, the turn next in order; a stroke or move in play: V. to load with shot, as a gun. SHOT′TING, imp. SHOT′TED, pp.: ADJ. loaded or charged with shot. BAR-SHOT, a bar of metal with a round head at each end, formerly discharged as shot from guns. CASE-SHOT, or CANISTER, balls packed in tin canisters in the form of cylinders, having wooden bottoms, and fitted to the calibre of guns. CHAIN-SHOT, two half-balls united by a chain. GRAPE-SHOT, a number of shot so arranged as to resemble a bunch of grapes, formerly used to load guns. RED-HOT SHOT, shot heated to redness in a furnace, and in this state fired from a gun. ROUND-SHOT, a solid sphere of iron or other material as loading for a gun. SHOT-HOLE, the hole made by shot. SHOT-LOCKER, a piece of wood pierced with holes for holding shot, or for shot resting on. SHOT IN THE LOCKER, money in hand. SHOT OF A CABLE, the splicing of two cables; the whole length of cables thus united. SHOT-TOWER, a lofty tower erected for making small shot, from the summit of which melted lead is allowed to drop through perforated plates into water or other liquid at the bottom, the drops assuming a globular form, and cooling in their descent. TO SHOT GUNS, to load them. TO SHOOT GUNS, to discharge them.

SHOT, n. *shŏt* [AS. *scot*, a portion, money (see SCOT 1)]: reckoning; proportional share of expense incurred at a tavern. SHOT-FREE, but usually spelled SCOT-FREE, without payment; unpunished. TO PAY ONE'S SHOT, to pay one's share of a common expense.

SHOT: term applied to all solid balls fired from any sort of firearms, those for cannon and carronades being of different grades of steel, those for small arms, of lead: the latter are known as bullets and small-shot. The shot used for guns at present vary from the 3-pounder, for boat and mountain artillery, to the 13-inch shot, or larger—the 13-inch weighing about 300 lbs., as a shell, or 700 lbs. as an elongated bolt. Generally, shot are cast. There are simple practical rules for calculating the weight of *spherical* shot from the diameter, and *vice versâ*, which are often useful in reading of artillery actions. Given the diameter in inches, to find the weight in lbs.: Cube the diameter, and multiply the result by 14; reject the two right-hand figures; those remaining give the weight in lbs.—Given the weight in lbs., to find the diameter in inches: Multiply the cube-root of weight by 1·923, and the result is the diameter of the shot in inches.

The modern method of making shot was invented by Watts of Bristol, England, about 1782. Originally lead was rolled into a sheet which was cut into little cubes, which by 'tumbling' in a barrel were made approximately spherical. Watts's method involved the pouring of melted lead from a height into water. A perforated vessel like a colander, or a ladle with a wide serrated lip is employed. The lead is melted in furnaces at a sufficient height above the water tank destined to receive the shot. Special towers are used for the purpose. 180 ft. is an average height: at Villach in Corinthia there is a shot-tower 249 ft. high. New York has 25 towers. The melted lead, poured as described, falls down through the centre of the tower. By surface tension it breaks up into globules and solidifies in its descent. At the bottom of the tower is a tank of water into which it falls. The holes in the colander vary from $\frac{1}{50}$, $\frac{1}{58}$, $\frac{1}{66}$, $\frac{1}{72}$ inch, etc., down to $\frac{1}{360}$ inch in diameter, the latter for No. 9 shot. The colander is faulty, as it delivers the stream with varying rapidity according to the depth of lead. The ladle with serrated lip is now preferred; its serrations vary in size according to the size of shot desired. A little arsenic is alloyed with the lead. The wet shot are dried, being finally rolled between flannel rollers. They are then rolled down an inclined plane. or sloping table. The imperfect shot fall into a receptacle beneath the edge of the table, while the good ones, acquiring high momentum, shoot over this into a second receptacle beyond it. A series of such planes is sometimes employed, with openings between to receive the bad shot, while the good ones go over the openings as above described. By passing through graduated sieves the different sizes are separated, and finally the shot is polished by being placed in a revolving cylinder or other 'tumbling box,' with graphite.

Different methods have been proposed to avoid the use of towers, such as the employment of a strong upward blast of air (Smith 1849) to retard the fall of the shot.—See also CANISTER: CASE-SHOT: GRAPE-SHOT.

SHOTE, n., or SHOAT, n. *shōt* [from SHOOT, which see: AS. *sceota*, a shooting or darting thing, a trout]: a young swine half grown, or less. SHOTE, n. *shōt*, in *OE.*, a young pig; a young trout or salmon; in *Amer. slang*, an inferior or worthless character.

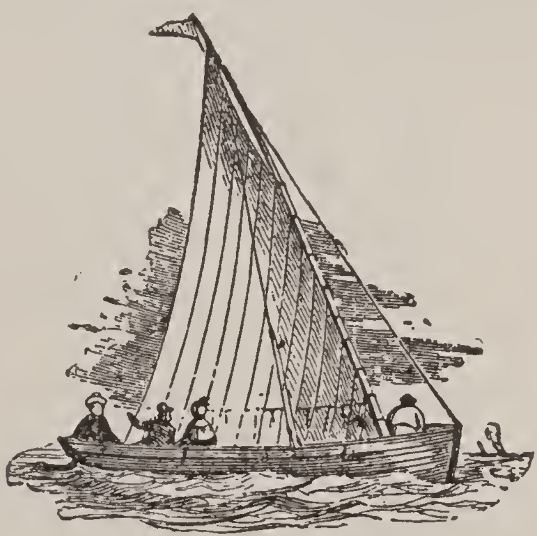
SHOTTEN, a. *shŏt'n* [from Shoot, which see]: having thrown out the spawn, as herring; gutted or dried for keeping, as herrings; out of its socket; curdled by keeping too long. Nook-shotten, in *OE.*, shooting or jutting out into nooks or angles. Shoulder-shotten, in *OE.*, strained in the shoulder.

SHOTTS, *shŏts:* small and ancient village of Lanarkshire, Scotland, close to the Kirk of Shotts, about 16 m. e. of Glasgow. About 3 m. s.e. of the Kirk, modern S., or S. proper, began to rise at the close of the 18th c., when the Shotts Iron Company erected their extensive ironworks there. Valuable coal and ironstone, peculiarly suited for manufacture of iron, abound in the district, and a large number of workmen are employed in ironmaking and molding. S. forms the half-way station on the branch of the Caledonian railway between Edinburgh and Glasgow. S. may be said to consist of three villages—viz., Stane, Shotts Iron-works, and Dykehead; united pop. (1881) 2,985: pop. of the civil parish of Shotts, 11,214.

SHOUGH, n. *shŏk* [see Shag]: OE. for Shock, a dog with long hair or shag; a shaggy dog.

SHOULD, v. *shûd:* pt. of Shall, which see.

SHOULDER, n. *shōl'dėr* [Swed. *skuldra;* Dan. *skulder;* Dut. *schouder;* Ger. *schulter*, a shoulder]: part of the body at the top of each side of the chest and at the bottom and side of the neck; joint connecting the human arm to the body, or the foreleg to a quadruped (see Shoulder-joint); anything resembling the shoulder; a prominence; sustaining power; support; strength: V. to push or thrust with violence; to take upon the shoulder. Shoul'dering, imp. Shoul'dered, pp. *-dėrd.* Shoulder-belt, a belt that passes across the shoulder. Shoulder-blade, the flat bone of the shoulder; the scapula. Shoulder-knot, an ornamental knot or ribbon, etc., worn on the shoulder. Shoulder-strap, a strap worn on or over the shoulder. Shoulder of mutton, the foreleg of a sheep; the name given to a triangular sail for a boat. To put one's shoul-



Boat with Shoulder-of-mutton Sail.

DER TO THE WHEEL, to exert one's full strength to overcome a difficulty. To GIVE THE COLD SHOULDER, to receive unkindly and indifferently, as a former intimate or friend.

SHOUL'DER-JOINT, THE: ball-and-socket joint uniting the arm to the body. The bones entering into its composition are the humerus or arm-bone, and the scapula or shoulder-blade, the large globular head of the former being received into the shallow glenoid cavity of the latter; an arrangement by which extreme freedom of motion is obtained, while the apparent insecurity of the joint is guarded against by the strong ligaments and tendons which surround it, and above by the arched vault formed by the under surface of the acromion and coracoid processes. See SCAPULA. As in movable joints generally, the articular surfaces are covered with cartilage, and there is a synovial membrane which lines the interior of the joint. The most important connecting medium between the two bones is the capsular ligament, a fibrinous expansion embracing the margin of the glenoid cavity above, while it is prolonged upon the tuberosities of the humerus below. From its relations with the surrounding muscles, the ligament derives much of its strength. Accordingly, in paralysis of the arm, one or two fingers can often be pressed into the joint toward the head of the glenoid cavity, from which the head of the humerus is now separated.

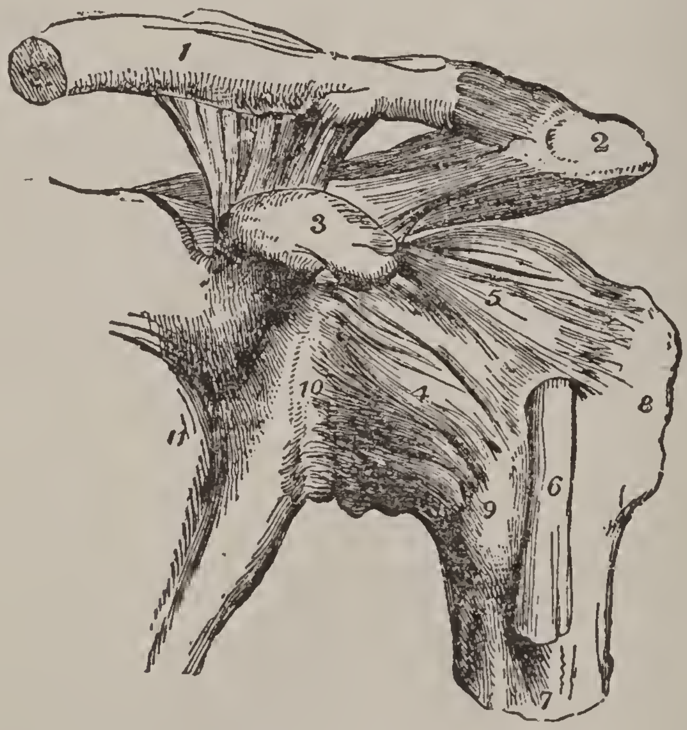


Fig. 1.—The left Shoulder-joint and its Connections.

1, the clavicle or collar bone; 2, the acromion process; 3, the coracoid process; 4, the capsular ligament; 5, the coraco-humeral ligament; 6, the tendons of the biceps muscle; 7, the shaft of the humerus or arm-bone; 8, the greater tuberosity of the humerus; 9 the lesser tuberosity; 10, the neck of the scapula; 11, anterior surface of the scapula.

SHOULDER-JOINT.

The shoulder-joint exhibits the following varieties of motion: 1. Flexion, to a great extent; 2. Extension, in much more limited degree; 3. Adduction, in an oblique direction, forward and inward; 4. Abduction very freely; 5. Circumduction; 6. Rotation slightly.

The morbid affections of the shoulder-joint may be divided into (1) those arising from disease, (2) those resulting from accident. The most common diseases are acute and chronic inflammation of the joint, which often terminate in its anchylosis or immobility. The principal accidents are fractures and dislocations. There may be fracture (1) of the acromion process, or (2) of the coracoid process, or (3) of the neck of the scapula, or (4) of the superior extremity of the humerus; or two or more of these accidents may be associated. Again the head of the humerus may be dislocated from the glenoid cavity as the result of accident in three different directions—viz. (1), Downward and inward into the axilla, which is by far the most common form; (2) Forward and inward; and (3) Backward on the infra-spinous fossa, or the dorsum of the scapula. The first of these varieties is so frequent that persons of ordinary intelligence should know how to recognize, and even (in an emergency) to treat it. The bones are in the position shown in the figure; and the following are the most prominent symptoms: 'The arm is lengthened; a hollow may be felt under the acromion, where the head of the bone ought to be; the shoulder seems flattened; the elbow sticks out from the side, and cannot be made to touch the ribs; and the head of the bone can be felt if the limb be raised, although such an attempt causes great pain and weakness, from the pressure exerted on the axillary plexus of nerves.' —Druitt's *Surgeon's Vade-mecum*, 8th ed. 282. There are at least five methods of treating this form of dislocation: it

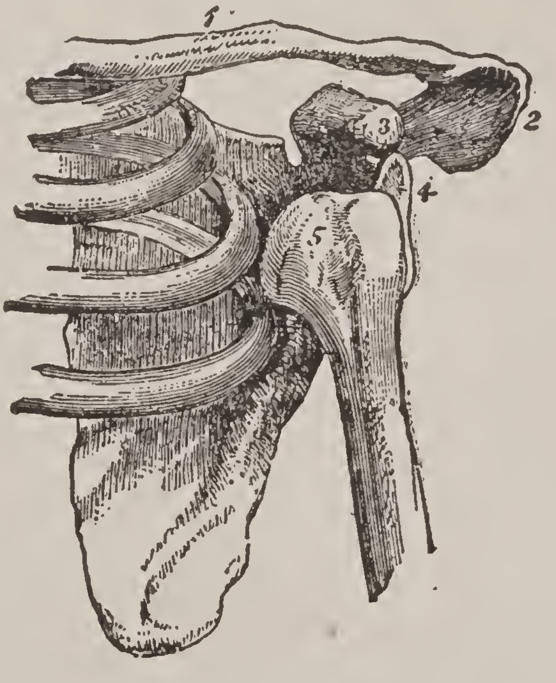


Fig. 2—Dislocation of the Shoulder-joint downward.
1, the clavicle; 2, the acromion process; 3, the coracoid process; 4, the glenoid cavity; 5, the head of the humerus lying in the axilla.

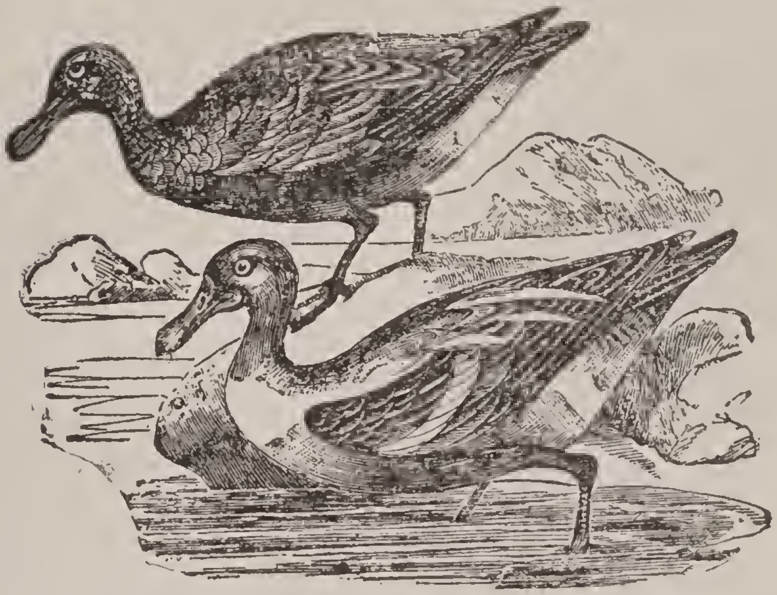
is sufficient to notice two of them. 1. Reduction by the heel in the axilla. The patient lies on a couch, and the operator sits at the edge, and puts his heel (the shoe or boot being previously removed) into the axilla, to press the head of the bone upward and outward, and at the same time pulls the limb downward by means of a towel fastened above the elbow (see fig. in Dislocation). 2. Reduction by the knee in the axilla. The patient being seated in a chair, the surgeon places one of his knees in the axilla, resting his foot on the chair. He then puts one hand on the shoulder, to fix the scapula, and with the other depresses the elbow over his knee.—For symptoms and treatment of the other forms of dislocation, and for different varieties of practice, see any systematic treatise on Surgery.

SHOUT, n. *showt* [a form parallel with *hoot:* Low Ger. *schuddern,* to shudder: It. *scioare,* to cry 'shoo' to frighten birds: mod. Gr. *skouzō,* I shout]: a loud burst of voice; a violent and sudden outcry of a multitude of men, expressing applause, triumph, and the like: V. to utter a sudden and loud outcry, as of joy or exultation. Shout'ing, imp.: N. the act of crying with sudden outburst of voice; a loud outcry, as of joy or exultation. Shout'ed, pp. Shout'er, n. *-ėr,* one who shouts. To shout at, to deride or revile with shouts.

SHOVE, v. *shŭv* [Dut. *schuiven;* Ger. *schieben;* Dan. *skuffe;* Icel. *skufa,* to push, to draw: AS. *scufan,* to thrust]: to thrust or push; to force or drive forward; to press against; to jostle: N. a thrust; a push. Shov'ing, imp. Shoved, pp. *shŭvd.* To shove by, to push away; to reject. To shove off, to move away by a push or a thrust, as a boat from the shore.

SHOVEL, n. *shŭv'l* [Ger. *schaufel;* Dut. *schuffel,* a shovel or similar implement—allied to L. *scabĕrĕ,* to scratch or scrape (see also Shove)]: an instrument consisting of a broad iron or wooden blade, more or less hollow, with a long handle, used for shoving and raising loose earth, etc.: V. to take up and throw or heap together with a shovel; to gather roughly; to use a shovel. Shovelling, imp. *shŭv'lĭng.* Shov'elled, pp. *-ld.* Shov'elful, n. *-l-fûl,* as much as a shovel will hold. Shov'elfuls, plu. Shov'eller, n. *-ėr,* one who shovels; a species of duck, having a spoon-like bill (see below). Shovel-board, a game played by sliding metal pieces at a mark along a board. Shovel-hat, a broad-brimmed hat turned up at the sides, and projecting in front, formerly worn by dignified clergymen.

SHOV'ELLER (*Spatula clypeata*): genus of ducks of the section having no lobe or pendent membrane on the hind toe, and remarkable for the expansion of the end of the mandibles in adult birds, particularly of the upper mandible. The lamellæ of the mandibles are long and very delicate. The legs are placed near the centre of the body, so that these birds walk much more easily than many of the ducks. The common S. (*S. clypeata*) is smaller than the wild duck, but rather larger than the widgeon. The S. is a winter visitant of Britain, but not very common. It is widely distributed over Europe, Asia, and in N. America, where it is most often seen in the s. and w. parts of the United States. Its flesh is very highly esteemed. A species of S. is found in Australia.



Shoveller, female and male (*Spatula clypeata*).

SHOW, v. *shō* [AS. *sceawian;* Dut. *schouwen,* to look, to inspect: Ger. *schauen,* to look: Dan. *skue,* to behold, to view]: to present to view; to make or enable to see or know; to reveal; to give proof of; to publish; to teach, instruct, or inform; to prove; to point out; to guide; to explain; to confer or bestow; to afford; to appear or be in appearance; to become well or ill: N. a sight or spectacle; exhibition, as a cattle or agricultural show; something exhibited for money; superficial appearance; ostentatious display; hypocritical pretense; public appearance; semblance. SHOW'ING, imp.: N. demonstration; exhibition. SHOWED, pt. *shōd.* SHOWN, pp. *shōn.* SHOWY, a. *shō'ĭ,* gaudy; making a great show. SHOW'ILY, ad. *-ĭ-lĭ.* SHOW'INESS, n. *-nĕs,* the state or quality of being showy; pompousness. SHOW-BILL, a printed advertisement in large letters, exhibited in a shop-window. SHOW-BREAD, usually SHEW-, among the *anc. Jews,* the loaves of bread placed weekly on the golden table in the sanctuary. SHOW-CASE, a case with a glass cover, in which articles of value are exhibited for sale. SHOWMAN, one who exhibits a show. SHOW-ROOM, a room where a tradesman or manufacturer displays his goods. To SHOW FORTH, to manifest. To SHOW OFF, to exhibit ostentatiously; to set off; to display one's self. To SHOW UP, to expose. SHOW OF HANDS, in *public assemblies,* hands raised up to signify a vote. DUMB-SHOW, action by representation.—SYN. of 'show, v.': to exhibit; display; prove; publish; proclaim; inform; teach; conduct; offer; afford; explain; expound; discover; appear; look; demonstrate; indicate; evince; argue; manifest,—of 'show, n.': spectacle; appearance; display; semblance; likeness; speciousness;

plausibility; exhibition; pomp; phantom; representation; sight; ostentation; parade;—of 'showy': gaudy; splendid; gay; stately; pompous; ostentatious; fine; gorgeous; grand; magnificent; sumptuous.

SHOW'-BREAD: see Shew-bread.

SHOWER, n. *show'r* [Goth. *skura*, a storm. Dut. *schoer;* Sw. *skur;* Icel. *skúr*, a shower: Ger. *schauer*, a shower]: a fall of rain of short duration; a copious fall or supply of anything: V. to water copiously as with rain; to pour down; to scatter in abundance; to bestow liberally; to wet or soak with rain. Show'ering, imp. Showered, pp. *show'rd.* Showery, a. *show'rĭ*, abounding in frequent falls of rain. Show'eriness, n. *-ĭ-nĕs*, the state of being showery. Show'erless, a. *-lĕs*, without showers. Shower-bath, an apparatus for pouring upon the body a shower of water.

SHOWERS OF FISHES: rare phenomena noticed in different parts of the world. A shower of small three spined sticklebacks fell near Merthyr-Tydvil in Wales, sprinkling the ground and house-tops over several sq. miles. The fish were alive when they fell; yet if caught up by a whirlwind from any of the brackish ponds near the sea, in which this species of fish abounds, they must have been conveyed through the air almost 30 m. A similar instance occurred at Torrens, in the isle of Mull, in which herrings were found strewed on a hill 500 yards from the sea, and 100 ft. above it.

Showers of fishes are much more frequent in those tropical countries where violent storms, sudden gusts of wind, and whirlwinds are most common. In India, a shower of fishes varying from a pound and a half to three lbs. in weight has been known to fall. Sometimes the fishes are living, more frequently they are dead, and sometimes dry or putrefying. They are always of kinds abundant in the waters of the neighborhood; and it cannot be doubted that they are carried up into the air by violent winds or whirlwinds: though they sometimes fall at a considerable distance from any water which could supply them. The sudden reappearance of fresh-water fishes in ponds which have been dried up for months in tropical countries is often popularly ascribed to their falling from the clouds; but the truth is, that they have been buried in the mud below, existing probably in a state analogous to that of animals in cold climates during hibernation. A pool, the bottom of which has long been dry, and on which grass has grown and cattle have walked, is again filled with fishes in a few hours after it is filled with water.

SHOWILY, SHOWINESS, SHOWY, SHOWN: see under Show.

SHOWT'L: Indian name for Sewellel (q.v.).

SHRANK, v. *shrăngk:* pt. of Shrink, which see.

SHRAPNEL-SHELL, n. *shrăp'nĕl-* [so named from the inventor, Gen. *Shrapnel*]: in *mil.*, a spherical case filled with musket-balls, and containing a bursting-charge of powder (see Shell, in Gunnery).

SHRED, n. *shrĕd* [O.Dut. *schroode*, a bit of paper: Ger. *schrot*, a piece, shred: AS. *screădian*, to shred; *screade*, a piece, strip]: a long narrow piece torn off; a fragment; a strip: V. to tear or cut off into long narrow pieces, as cloth. SHRED'DING, imp.: N. the act of cutting into shreds; that which is cut or torn off; a fragment. SHRED, pt. pp. *shrĕd.* SHRED'LESS, a. *-lĕs*, having no shreds. SHRED'DY, a. *-dĭ*, consisting of shreds or fragments. A THING OF SHREDS AND PATCHES, applied to anything that is patched, unconnected, or not original, as a book.

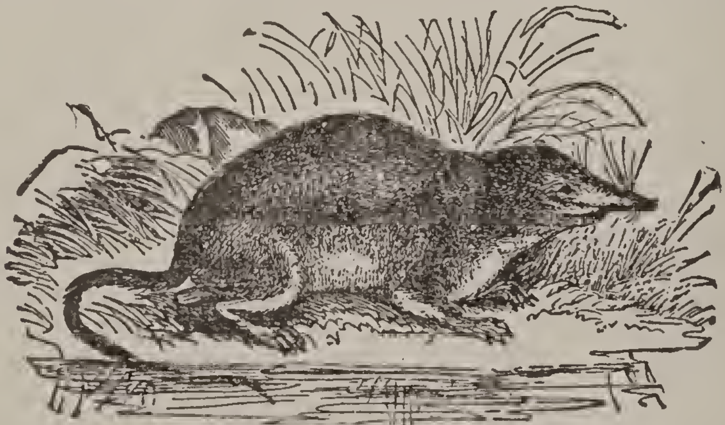
SHREVE, *shrēv*, HENRY MILLER: inventor: 1785, Oct. 21—1854, Mar. 6; b. Burlington co., N. J. From boyhood he was interested in navigation. He was the first to ascend the Mississippi to Louisville in a steam vessel, and built the steamboat *Washington* on improved plans of his own. This involved him in a suit with Robert Fulton, which was maintained in his favor. He was supt. of western river improvements 1826–41; opened the Red river for navigation 1,200 m. by removing a great accumulation of logs and driftwood which obstructed the river 160 m.; built a boat for removing snags from the Ohio river, and invented a battering ram for harbor defense. He died at St. Louis.

SHREVEPORT, *shrēv'port:* city, port of delivery, and cap. of Caddo parish, La.; on Red river, and on the Texas and Pacific, the St. Louis Arkansas and Texas, the Shreveport and Houston, and the Queen and Crescent Route railroads; 40 m. e. of Marshall, Tex., 325 m. n.w. of New Orleans. It is at the head of low-water navigation on the Red river, on which it has a frontage of nearly 2 m., extends back from the river 1½ m., and is in one of the most noted cotton-growing regions of the country. For many years its chief industry was handling cotton, receiving and shipping more than 100,000 bales annually; but within a few years it has developed considerable cattle trade and important manufactures. It ships largely by rail and water, having direct steamboat communication with New Orleans, and its location in the extreme n.w. corner of the state makes it the distributing point of a large territory. In 1890 the city contained 12 churches, 5 public schools, 4 seminaries and colleges, 2 large hotels and several small ones, State Charity Hospital, U. S. Marine Hospital, electric light and gas works, improved water and sewerage systems, electric and horse street railroads, opera-house (cost $55,000), and Board of Trade and Cotton Exchange buildings. The assessed valuation of real property was $2,349,750; personal $1,500,000. There were 2 nat. banks (cap. $800,000), 1 incorp. bank ($200,000), 1 private bank, 2 daily and 2 weekly newspapers, and a home fire insurance com. (cap. $200,000). The industries included 2 cotton compresses ($50,000 ch.), cotton-seed oil mill ($200,000), cotton-gin manu. and foundry ($20,000), boiler-works, cotton-compress manufacturing works. In 1902 there were 10 public schools, 3 nat. banks (cap. $500,000), 3 daily and 5 weekly newspapers. The total assessed valuation of property was $6,561,189; bonded debt Feb., 1903, $197,000. The site of S. was given by the

Caddo Indians to Larkin Edwards, a white benefactor, 1835, and in the following year he sold it to a syndicate, who obtained a city charter 1839.—Pop. (1870) 4,607; (1880) 8,009; (1890) 11,979; (1900) 16,013.

SHREW, n. *shrô* [OE. *schrewid*, wicked: Ger. *schroff*, rugged, rude: prov. Ger. *schrô*, rough to the touch, poor: Low Ger. *schrœ*, bare]: a peevish, turbulent, vexatious woman; a scold; a virago; in *OE.*, used in the general sense of a bad man. SHREW'ISH, a. *-ĭsh*, peevish; vixenish; petulantly clamorous. SHREW'ISHLY, ad. *-lĭ*. SHREW'ISHNESS, n. *-nĕs*, the state of being shrewish; frowardness; petulance.

SHREW, or SHREWMOUSE, n. *shrô'mows* [AS. *screawa*, a shrewmouse: akin to OE. *schrewid*, wicked, as the bite of the animal was supposed to be fatal—see also SHREW 1]: term designating small quadruped of family *Sorecidæ;* often called shrewmouse, and popularly confounded with mice and rats, but really very different, having insectivorous and not rodent teeth. The head is very long; the snout elongated, attenuated, and capable of being moved about; the eyes small; the tail long: both body and tail covered with fine short hair; the feet have a broad sole and 5 toes. The genus *Neosorex* has comparatively short ears; in the genus *Sorex*, the most common, the ears are large. The smallest of Amer. mammals is *S. personatus;* other species occur mostly on the Pacific slope.—The MOLE SHREW (*Blarina talpoides*), with large fore-feet, is found from Canada to the Gulf.—The COMMON S. of Britain (*S.* or *Corsira vulgaris*) was, until recently, confounded with *S. araneus*, a species common in continental Europe. It is nearly 2½ inches in length from the snout to the root of the tail, the length of which is about 1¾ inches. It abounds in dry fields, gardens, and hedge-banks; feeding chiefly on insects and worms, for which it grubs with its long snout among the roots of herbage. It burrows, and makes long *runs* just under the surface of the ground. It is an excessively pugnacious little animal, and the males have fierce combats in spring, in which many are killed. Cats kill the S., but do not often eat it, probably on account of its strong musky smell, but it is the prey of weasels, hawks, owls, and shrikes. Harmless and inoffensive as it is, it has long


Common Shrew (*Sorex vulgaris*).

been regarded with dread and aversion by the vulgar. (See White's *Natural History of Selborne.*)—Another even smaller species, *S. pygmæus*, is found in Ireland, where it is called the Shrew Mole.—The Water S. (*S. fodiens* or *Crossopus fodiens*) is larger than the Common S., being fully 3 inches long, and the tail 2 inches. It is of blackish brown color, gray or white on the underparts. It burrows in the banks of streams, and is very aquatic in its habits. It is found in many parts of Great Britain.—Some of the Indian species of S. attain a much larger size, e.g., one called Musk Rat (q.v.). There is an Italian species, smallest of all known Mammalia; only about 1½ inch in length, exclusive of the tail, which measures about one inch.

SHREWD, a. *shrôd* [from Eng. Shrew: *shrewd*, in the sense of sharp, sagacious, arises from the same feeling which has given to the term *silly*, originally signifying innocent, blessed, the sense *foolish*—the *wicked man* being regarded as intelligent and sharp-sighted, the *good* as simple and easily deceived—see Wedgwood]: sagacious; acute; of nice discernment; sly; artful; in *OE.*, pinching; painful; mischievous. Shrewd'ly, ad. *-lĭ*, in a shrewd manner; with a good guess; in *OE.*, mischievously; destructively; vexatiously. Shrewd'ness, n. *-nĕs*, the quality or state of being shrewd; discrimination; sagacity; in *OE.*, sly cunning; archness.—Syn. of 'shrewd': acute; keen; sagacious; sharp; critical; astute; penetrating; artful; subtle; discerning.

SHREW MOLE (*Scalops*): genus of insectivorous mammalia, of family *Talpidæ*, and very nearly allied to the moles. There are 6 incisors, 2 canine teeth, 8 false molars, and 6 true molars in each jaw. The ear is destitute of auricle; the eyes are very small, and much concealed: the feet 5-toed, the fore-feet large, as in the mole. The whole figure, also the habits, resemble those of the mole.—There are several species, all natives of N. America.

SHREWSBURY, *shrôz'ber-ĭ:* a township in Monmouth Co., N. J.; on the Shrewsbury river and the N. J. Central railroad; 5 m. n.w. of Long Branch. The village contains 2 churches, a seminary for young ladies, a savings bank, and several factories. Previous to 1890 it contained the larger village of Red Bank. Pop. of tp., excluding Red Bank (1890) 4,222; (1900) 3,842.

SHREWSBURY, *shrôz'bĕr-ĭ:* parliamentary and municipal borough and market town, cap. of Shropshire; on the Severn, by which it is nearly surrounded, 163 m. n.n.w. of London, by the London and Northwestern railway. It is irregular in plan, contains many inferior houses, partly of timber, but often very picturesque. In the modern quarters, the houses are handsome and regular. Two bridges, the 'English' and the 'Welsh,' cross the Severn and connect the town with the suburbs of Abbey-Foregate and Coleham on the e. and Frankwell on the w. To the n. is the other suburb of Castle Foregate. The town contains interesting remains of the ancient walls, the castle, two monasteries, and a Benedictine abbey. The remains of the Abbey

Church now form the church of Holy Cross. There are other ecclesiastical edifices, a free school, with an income from endowment of £3,100 a year, and 22 exhibitions to the universities; a number of other important schools, institutes, hospitals, etc. The Town and County Hall, the Public Rooms, a handsome Greek structure, and the Market-hall, erected 1867–8, in the Italian style, are notable. S. carries on manufactures of linen thread, canvas, and iron wares, and there is a salmon fishery on the Severn. The Brawn and 'Shrewsbury Cakes' made here have long been held in esteem.—Pop. (1871) 23,406; (1881) 26,478; (1891) 26,967; (1901) 30,000.

S., called by the Welsh Pengwern, was named by the Anglo-Saxons *Scrobbes-Byrig*, and of this the modern name is a corruption. The town connects itself intimately with the history of the country from the 12th to the 17th c. It was taken by Llewellyn the Great, Prince of North Wales, 1215, during the disturbances between King John and the barons; and 1403, Henry IV. here defeated the insurgent Percies and their allies with great slaughter. It was taken by the parliamentarians 1644.

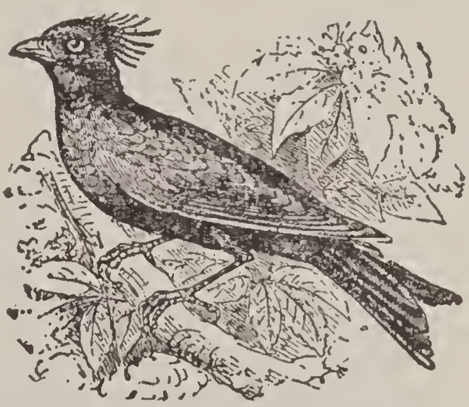
SHRIEK, v. *shrēk* [Dan. *skrige;* Sw. *skrika*, to cry, to scream: W. *ysgrêch*, a scream: Ger. *schreien*, to cry out (see SCREECH)]: to utter a sharp shrill cry; to scream, as in sudden fright, or in anguish: N. a shrill piercing cry, as of sudden terror or anguish. SHRIEK'ING, imp.: ADJ. crying out with a shrill voice: N. a crying out with a shrill voice. SHRIEKED, pp. *shrēkt.*

SHRIEVALTY, n. *shrēv'ăl-tĭ* [see SHERIFF]: another spelling of SHERIFFALTY; the office or jurisdiction of a sheriff.

SHRIFT: see under SHRIVE.

SHRIKE, n. *shrīk*, or BUTCHER-BIRD [from SHRIEK, which see: Dan. *skrika*, a jay], (*Lanius*): genus of birds of family *Laniadæ* (q.v.), approaching more nearly in character to the *Falconidæ* than any other of that family; having a short, thick, and compressed bill, the upper mandible curved, hooked at the tip, and furnished with a prominent tooth, the base of the bill beset with hairs, which point forward. The species are numerous, most of them natives of warm climates, though some occur in more northern regions. They prey on insects and small birds, and have a remarkable habit of impaling their prey on thorns; so that the nest of a S. may be discovered by the numerous insects impaled in the neighborhood of it. Shrikes kill and impale many insects which they never eat, leaving them to dry in the sun; and in confinement they make use for this purpose of a nail, if provided with it, or stick portions of their food between the wires of the cage. They can imitate in some degree the notes of many birds, particularly those which are the utterance of distress, and they seem to make use of this power in order to attract birds within their reach. The most common European species is the RED-BACKED S. (*L. collurio*), only about 7½ inches in length, about a third of the length being formed by the tail, which is square at the end. Insects are the chief food of this bird, but it preys also on small birds, young frogs, and even young pheasants.—The GREAT GRAY S., or SENTINEL S. (*L. excubitor*), known in the United States as the Butcher-bird, is about the size of a thrush. It is common in parts of Europe, and is found also in Asia and N. America. It was formerly used by falconers in catching hawks, of which it is greatly afraid, screaming loudly on their approach: the falconer waited in concealment, after fastening some pigeons and a S. to the ground, until the scream of the S. gave him notice to pull the string of his net.—Another species, common in western states, is *L. excubitoroides*.

Great Gray Shrike (*Lanius excubitor*).



Forked-tail Crested Shrike (*Dicrurus cristatus*).

SHRILL, a. *shrĭl* [Scot. *skirl*, to cry with a sharp voice: Norw. *skryla*, to cry in a high note, as children: Low Ger. *schrell*, sharp in sound]: sharp and piercing, applied to sound: V. in *OE.*, to pierce the ear with sharp quick sounds; to express in a shrill manner. SHRILL'ING imp.: ADJ. sounding shrill. SHRILLED, pp *shrĭld* SHRILL'Y, ad -*ĭ*. SHRILL'NESS, n. -*nĕs*, the state of being shrill or acute in sound; sharpness of the voice.

SHRIMP, n. *shrĭmp* [Dut. *krimpen*, to contract or diminish: AS. *scrimman*, to wither or dry up: Ger. *schrumpfen*, to shrivel. Scot. *scrimp*, to deal sparingly with one, scanty]: a small shell-fish, allied to the lobster; anything very small of its kind; a little wrinkled man. SHRIMP'ER, n. *-ėr*, one who catches shrimps with a dredge-net on a beach. SHRIMP-NET, net fastened on a pole, used for catching shrimps.—*Shrimp* (*Crangon*) is genus of crustaceans of sub-order *Decapoda*, family *Crangonidæ*, allied to lobsters, cray fish, and prawns. The form is elongated, tapering, and arched as if hunch-backed. The claws are not large, the fixed finger merely a small tooth, the movable finger hook-shaped. The beak is very short, affording a ready distinction from prawns. The whole structure is very delicate, almost translucent; and the colors are such that the creature may readily escape observation, whether resting on a sandy bottom, or swimming through the water. The quick darting movements of shrimps, like short leaps, however, betray them to one who looks attentively into a pool left by the retiring tide on a sandy shore. When alarmed, they bury themselves in the sand, by a peculiar movement of their fanlike tail fin.—The COMMON S. (*C. vulgaris*) is very abundant on the British coasts, and very generally elsewhere on those of Europe, wherever the shore is sandy. It is about two inches long, of greenish-gray color, dotted with brown. It is in great esteem as an article of food, and is taken generally by nets in the form of a wide-mouthed bag, stretched by means of a short cross-beam at the end of a pole, and pushed along by the shrimper wading to the knees. Sometimes a net of larger size is dragged along by two boats. This species, after boiling, is brown in color.—Another species, *Pandalus annulicornis*, is bright red after boiling.—Other species of S. seem equally fit for the table: they belong rather to more southern climates. Shrimps are interesting inmates of the aquarium.—The name S. is extended to several related crustaceans, in the United States. See PRAWN.

SHRINE, n. *shrīn* [AS. *scrin;* Ger. *schrein;* F. *écrin;* L. *scrinĭum*, a cabinet or place to keep anything in]: a case or place where sacred things are deposited; a reliquary; a decorated tomb; a sacred place; an altar: V. to enshrine. SHRIN'ING, imp. SHRINED, pp. *shrīnd*.

Portable Shrine, Malmesbury Abbey.

SHRINK, v. *shrĭngk* [AS. *scrincan,* to contract from drought: O.Flem. *schrincken,* to contract: Dut. *schrikken,* to start back: Norw. *skrekka,* to shrink, as cloth: Sw. *skrynka,* a wrinkle, a pucker]: to draw spontaneously or be drawn into less size or bulk; to shrivel; to cause to contract; to decline action; to recoil, as from fear or disgust; to withdraw; to make to contract or dwindle: N. contraction; withdrawing from fear or disgust. SHRINK'ING, imp.: N. a drawing into less compass or bulk; the process of damping or wetting woolen cloth to cause it to contract before being cut and made into garments; act of drawing back through fear or disgust. SHRANK, pt. *shrăngk,* did shrink. SHRUNK, pt. pp. *shrŭngk.* SHRUNKEN, pp. *shrŭngk'n:* ADJ. contracted; shrivelled. SHRINKINGLY, ad. *shrĭngk'ĭng-lĭ.* SHRINK'AGE, n. *-āj,* a contraction into a less bulk or compass; loss by gradual evaporation or absorption, as a liquid in casks. SHRINK'ER, n. *-ĕr,* one who shrinks.

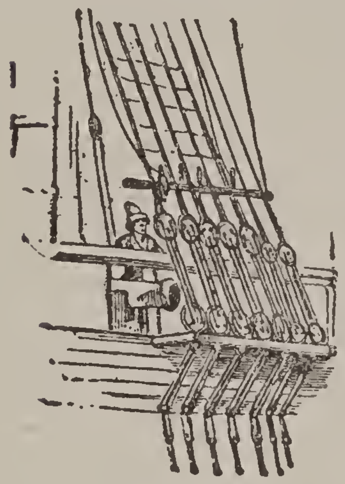
SHRIVE, v. *shrīv* [probably from L. *scribĕrĕ,* to write, to draw up a law or decree: Sw. *skrift,* shrift: Icel. *skript,* reprimand, punishment: Low Ger. *schreve,* a line: AS. *scrifan,* to shrive, to enjoin, to judge]: to make confession to a priest; to hear a confession, with the imposition of penance, and the giving of absolution following thereon. SHRI'VING, imp.: N. a confession to a priest. SHRIVED, pt. *shrīvd,* or SHROVE, pt. *shrōv,* did shrive. SHRIVEN, pp. *shrĭv'n.* SHRIVER, n. *shrī'vĕr,* one who shrives; a confessor. SHRIFT, n. *shrĭft* [AS. *scrift*]: confession made to a priest, generally applied to the confession of a dying person; absolution. SHORT SHRIFT, said of persons executed shortly after condemnation; *colloquially,* little mercy.

SHRIVEL, v. *shrĭv'l* [Sw. *skrynka,* a wrinkle: Icel. *skrafa,* to creak like dry things: prov. Eng. *shravel,* dry fagot-wood]: to cause to contract into wrinkles; to contract into wrinkles; to crumple up. SHRIV'ELLING, imp. SHRIV'ELLED, pp. *-ld:* ADJ. contracted into wrinkles.

SHROFF, n. *shrŏf* [Ar. *sarraf*]: in *E. Indies,* a banker or money-changer. SHROFF'AGE, n. *-āj,* the examination of coins, and the separation of the good from the debased.

SHROPSHIRE, *shrŏp'shĕr,* or SALOP, *să'lop:* frontier county in w. England, bounded w. by n. Wales, e. by Stafford and Worcester; 811,167 acres: cap. Shrewsbury. The Severn, principal river, enters the county from Montgomeryshire, about 12 m. w. of Shrewsbury, flows generally s.e. 70 m. across the county, is navigable throughout, and is joined by two considerable tributaries, the Tern and Teme. N. and n.e. of the Severn, the county is generally level and under tillage; s. and s.e., it is hilly and mountainous, and here cattle-breeding is extensive. A breed of horned sheep is peculiar to this county. More than three-fourths of the whole acreage are arable, or in pasture and meadow. The soil is generally fertile and well cultivated, though there are extensive tracts of waste land. S. is remarkable for mineral wealth. The coal, iron, copper, and lead fields of Coalbrookdale, Snedshill, Ketly, etc., are very productive. Several thousand persons are employed in raising coal, iron, stone, and lime, and in the iron manufacture.—Pop. of county (1871) 248,111; (1881) 248,014; (1891) 236,324; (1901) 239,297.

SHROUD, n. *shrowd* [AS. *scrud*, what is cut up, a garment, clothing: Dan. and Sw. *skrud*, dress: Icel. *skrud*, ornament, clothing; *skryda*, to adorn, to clothe: closely allied to SHRED]: that which clothes, covers, or shelters; a covering; the dress of a corpse; a winding-sheet: V. to cover; to veil; to shelter from danger; to take shelter; to conceal; to envelop; to dress for the grave. SHROUD'ING, imp. SHROUD'ED, pp. SHROUD'LESS, a. *-lĕs*, without a shroud. SHROUDS, n. plu. in a *ship*, a range of long and strong ropes, partly forming a rope-ladder, extending from the head of a lower mast on each side, and fastened to the sides of the ship, for the lateral support of the mast. They are crossed by thinner ropes, called ratlines, to form steps or ladders. The topmast shrouds in ship-rigged vessels are similar, except that they terminate in a row of dead-eyes on the outside of the tops.—The term shrouds is applied also to sail-ropes, and sometimes to the sails themselves.



Shrouds.

SHROVE, a. *shrōv* [from SHRIVE, which see]: a word only used in composition, as SHROVETIDE, n. *-tīd* [AS. *tid*, time, season]: (see below). SHROVE-TUESDAY, n. confession-time; the day immediately preceding the first day of Lent or Ash-Wednesday. SHROVING, n. *shrō'vĭng*, the festivity of Shrovetide.

SHROVE'TIDE (literally 'confession-time'): name given to the days immediately preceding Ash-Wednesday, which (as indeed the whole period after Septuagesima Sunday appears to have been) were anciently days of preparation for the penitential time of Lent; the chief part of which preparation consisted in receiving the sacrament of penance, i.e., in 'being shriven,' or confessing. In the modern discipline of the Rom. Cath. Church a trace of this is preserved, and in many countries the time of the confession which precedes the paschal or Easter communion begins from Shrovetide. These days were sometimes called Fasting-tide or Fast-mass, names still retained in parts of Great Britain. The name S. was retained in England after the Reformation, though the practice of 'shriving' was abandoned. The precept of 'shriving' having been fulfilled, the faithful, on the eve of beginning the Lent, were indulged with permission to give themselves up to amusements and to festive celebrations, of which the counterpart is still seen in the continental carnival. In England, the pastimes of football, cock-fighting, bull-baiting, etc., were, till a late period, recognized usages of S.; and the festive banquets of the day are still represented by the pancakes and fritters from which Pancake Tuesday took its name, and by the 'collops' which gave the title to Collop Monday. These usages are gradually disappearing. See MARDI GRAS.

SHRUB, n. *shrŭb* [Ar. *shurb,* a drink: akin to *sherbet* (see SYRUP)]: kind of liqueur made chiefly in the W. Indies, composed of lime or lemon-juice and syrup or sugar, to which a small portion of rum is added; other flavoring materials are used occasionally.

SHRUB, n. *shrŭb* [AS. *scrob,* a shrub: Norw. *skrubba,* the dwarf cornel-tree: prov. Dan. *skrub,* a bush: Dan. *skrubbet,* rough, rugged: akin to Eng. *scrub*]: woody plant of less size than a tree; a low dwarf tree; plant with woody stem and branches like a tree, but not generally exceeding 20 ft. in height (usually much less), and branching near the root, so as to have no main stem of considerable height. A shrub of small size and much branched is often called a *bush.* There is no important botanical distinction between trees and shrubs, and the same genus often includes species of both kinds. Many shrubs, e.g., honeysuckle, are climbers.

In English law, whoever plants a shrub thereby makes it a part of the soil, and it becomes a kind of fixture, incapable of being removed by tenants, unless the tenant is a nurseryman, who makes a business of planting and removing shrubs. Decisions in the United States are to the same general effect, though the law seems not quite clear on all points. SHRUB'LESS, a. *-lĕs,* wanting in shrubs. SHRUB'BERY, n. *-bĕr-ĭ,* plantation of shrubs. SHRUB'BY, a. *-bĭ,* full of shrubs; consisting of shrubs. SHRUB'BINESS, n. *-bĭ-nĕs,* state or quality of being shrubby.

SHRUB'BERIES, ORNAMENTAL: plantations of shrubs for beautifying lawns or grounds in the vicinity of houses. The larger number of shrubs set for this purpose present their finest appearance in summer; but in recent years the list has been greatly enlarged, and now embraces many plants highly ornamental in winter. Where one of the leading designs of S. is to separate the lawn from the adjoining field, evergreens are very desirable. But for merely ornamental purposes, mixed S. of evergreens and deciduous shrubs are much to be preferred. Forest trees properly have no place in S., though they are sometimes planted with a view to their removal when they become so large as to make them undesirable. One of the principal difficulties in forming S. is to arrange for a proper number of shrubs. If only enough are set to give a good appearance when they are grown, they will, for some years, appear very open and imperfect. On the other hand, if enough shrubs are planted to give the grounds a pleasing appearance at once, there will soon be an overcrowded look, detracting greatly from their beauty. These evils are to be obviated by planting duplicates, and as the shrubs increase in size removing those not required. Careful pruning must be given to keep the strong-growing shrubs within bounds, and flowering shrubs should be cut back after the flowers have fallen. Shrubs which are hardy in the climate in which they are to be grown should be selected; those which bloom should be so chosen as to secure both a succession of flowers and contrasting colors; and a proper proportion of the classes desirable for flowers, and of those prized for foliage, should be maintained.

SHRUG, n. *shrŭg* [Sw. *skrukkå*, to huddle one's self up: Dan. *skrugge*, to stoop: Norw. *skrukka*, a wrinkle]: a drawing up of the shoulders, expressive of doubt, dissatisfaction, or contempt: V. to contract or draw up the shoulders in order to express doubt, contempt, etc. SHRUG'GING, Imp. SHRUGGED, pp. *shrŭgd.*

SHRUNK, v. *shrŭngk*, or SHRUNKEN, *shrŭngk'n:* pp. of SHRINK, which see.

SHUBRICK, *shū'brĭk*, WILLIAM BRANFORD: naval officer: 1790, Oct. 31--1874, May 27; b. Bull's Island, S. C. In 1805 he entered Harvard Coll., but left it in 1806, having been appointed a midshipman, and assigned to the sloop-of-war *Wasp.* He was in active service during the war of 1812, serving on the *Hornet*, *Constellation*, and *Constitution.* When he returned to the U. S. 1815, May, after 8 years of distinguished services, he was voted a sword by his native state, and a medal by congress, and was included in the vote of thanks to Stewart and his officers. He was promoted commander 1820, capt. 1831. At the beginning of the Mexican war, at his own request for sea-service, he was put in command of the Pacific squadron, and sailed from Boston 1846, Aug., and reached the Pacific coast 1847, Jan. He took the cities of Mazatlan, Guaymas, La Paz, and San Blas, and with his naval forces held them during the war. In 1858 he commanded a fleet of 19 vessels sent to demand redress of Paraguay for firing on the U. S steamer *Waterwitch.* He arrived at Asuncion 1859, Jan. 25, and compelled the S. Amer. republic to apologize and pay a money indemnity. He served as chief of the bureau of construction 1853, and was chairman of the light-house board 1854–58, and again 1860–70. He was retired 1861, but continued chairman of the light-house board. 1862, July 16, he was commissioned rear admiral after 55 years of almost constant service. He died in Washington.

SHUCK, n. *shŭk* [prob. connected with *shock*]: a shell or covering; a husk or pod, especially the shell or covering of a nut, as a walnut, etc.; the case or covering of the larvæ of certain insects.

SHUDDER, n. *shŭd'dėr* [O. Dut. *schudden;* Ger. *schüttern*, to shiver]: a cold tremor; a shaking with fear or horror; V. to feel a cold tremor from fear, horror, or aversion: to quake; to tremble. SHUD'DERING, imp.: N. a quaking with terror or aversion. SHUD'DERED, pp. *-dėrd.* SHUD'DERINGLY, ad. *-lĭ.*

SHUDE, n. *shôd* [probably from SHED 3, which see]: the husks of rice, and certain other refuse, employed in adulterating oil-cake.

SHUE: see SHOO.

SHUFELDT, *shŭ'fĕlt*, ROBERT WILSON: naval officer. b. Red Hook, N. Y., 1822, Feb. 21. He entered the U. S. navy as midshipman 1839; was promoted master and lieut. 1853, but resigned the next year, and was connected with various steamship lines. At the breaking out of the civil war he was appointed consul-gen. to Havana; was reinstated in the navy 1862, and commanded the *Conemaugh* in the Charleston blockade, and the *Boteus* of the eastern Gulf squadron. After the war he served in the E. India and the Asiatic fleets. He was commissioned capt. 1869, commodore 1876, and was chief of the bureau of equipment and recruiting in the navy dept. 1875–78. In 1878–80 he sailed round the world in the *Ticonderoga,* touching at many points in Africa, the E. Indies, and Asia with the object of promoting American commerce. He was connected with the Amer. legation at Pekin, China, 1881–2; was promoted rear-admiral 1883 ; and retired 1884. He d. 1895, Nov. 7.

SHUFFLE, v. *shŭf'fl* [Bav. *schufeln,* to go along scraping the ground with one's feet: O. Dut. *schuffelen,* to drive by kicks and shoves (see SCUFFLE 1)]: to shove one way and the other; to mix by rapidly changing one thing into the place of another; to throw or change a pack of cards into a new arrangement; to shift ground; to evade fair questions; to play mean tricks; to prevaricate; to quibble; to move with an irregular gait; to move the feet backward and forward with a scraping noise; in *OE.*, to remove or introduce with tricky or fraudulent tumult: N. the act of mixing by changing places; an evasion; an artifice. SHUF'FLING, imp. *-fling:* N. act of one who shuffles; trick; artifice; an irregular gait: ADJ. prevaricating; evasive; moving with irregular gait. SHUF'FLED, pp. *-fld.* SHUF'FLINGLY, ad. *-fling lĭ.* SHUF'FLER, n. *-flėr,* one who shuffles; one who prevaricates. To SHUFFLE OFF, to put off trickishly; to move off with irregular gait; to push or shove aside. To SHUFFLE OUT OF, to evade a duty, burden, etc. To SHUFFLE UP, to form or throw together hastily or confusedly.—SYN. of 'shuffle, v.': to quibble; evade; equivocate; prevaricate; sophisticate; cavil; shift; struggle; confuse.

SHUGSHUT, *shôg'shôt:* small town of Turkey in Asia, in Anatolia, on the left bank of the Sakaria, 95 m. in direct line s.e. of Constantinople. On an adjacent hill is the tomb of Othman (q.v.), founder of the Ottoman dynasty. The tomb, resembling the handsomest and most ancient of the Turkish sepulchres at Constantinople, stands amid a grove of cypresses and evergreen oaks.—Pop. estimated about 8,000.

SHUMAC, n. *shô'măk:* see SUMACH.

SHUMALA'RI: see HIMÁLAYA.

SHUMLA, *shôm′lâ:* city of Bulgaria, about half-way along the line of railway which connects Rustchuk and Varna, 60 m. s.s.w. of Silistria. It is bounded n. and w. by mountains, and s. and e. by an undulating plain furrowed by valleys that extend n. to the Danube. Its situation is pleasing, and the character and distribution of its buildings give it a picturesque appearance. The roads from the former Turkish fortresses on the lower Danube and in the Dobrudscha on the n., and from the passes of the Eastern Balkan on the s., converge on S., giving it importance as a strategic position. Under the Turkish sway, S. was one of their most important strongholds, with very strong and extensive fortifications; and possessed a citadel, arsenal, capacious magazines, large and numerous barracks, and a military hospital. The plain around was studded with detached forts. S. was attacked in vain by the Russians 1774, 1810, and 1828. The Congress of Berlin, which established Bulgaria as an autonomous principality 1878, resolved that the fortifications of S. and other Bulgarian towns should be destroyed.—In S. are nearly 40 mosques. Wine and silk are largely produced; there are manufactures of copper. tin, and leather. Pop. (1881) 23,093, and still comprising large proportion of Turks or Mohammedans; (1888) 23,161; (1900) 22,928.

SHUN, v. *shŭn* [AS. *scunian*, to avoid: Icel. *skunda;* Dan. *skynde*, to hurry]: to keep clear of; to avoid; to turn away from; to endeavor to escape; to neglect; not to mix or associate with. SHUN′NING, imp. SHUNNED, pp. *shŭnd.* SHUN′LESS, a. inevitable; unavoidable.

SHUNT, v. *shŭnt* [a corruption of *shun*, in its provincial sense of to shove on one side: OHG. *scuntan*, to urge on]: in *railway management*, to remove a wagon, a carriage, or a train, from one line of rails on to another; to turn a train into a siding; to delay; to put off unnecessarily and vexatiously. SHUNT′ING, imp.: N. the act of removing wagons, etc., from one line of rails on to another. SHUNT′ED, pp. SHUNT′ER, n. *-ėr*, a railway servant employed in shunting. SHUNT GUN, a rifled firearm having two sets of grooves, the shot being passed down the one set, and passing out, when fired off, by the other.

SHUNT SYSTEM OF RIFLING: ingenious arrangement for securing the accurate centring of a projectile discharged from a rifled cannon. To obtain precision of aim and range, it is absolutely essential that the axis of a projectile should, at the moment of discharge, coincide exactly with the axis of the bore. This can scarcely be obtained unless the shot fits with extreme tightness into the gun; and if it does so, and the gun is a muzzle-loader, it is scarcely possible to load it. In the ordinary gun the projectile is smaller than the bore, so as to pass readily into the gun, resting, of course, on the bottom of the bore. The projectile is covered with a soft metal, e.g., lead, which expands with the pressure behind, and fits the shot tight into the grooves; but from the fact that it rested (at the beginning of the expansion) on the bottom of the bore, the axis of the shot is always below the axis of the bore, causing deviation from aim. To obviate this, Sir William Armstrong designed the 'shunt' system, which in some respects was found effective. A 'shunt-gun' has two sets of grooves, one down which the studs on the projectile are passed in loading, and another, not so deep, along which the studs pass in discharging, thus fitting tightly in the shallower rifling of the double groove, the ball being shunted from one set to the other at the bottom of the bore by the explosion of the charge.

The shunt system has been found complicated, and liable to damage projectile and gun; it has therefore been superseded: see RIFLED ARMS.

SHURTLEFF, *shėrt'lĕf*, NATHANIEL BRADSTREET, M.D.: 1810, June 29—1874, Oct. 17; b. Boston. He graduated from Harvard College 1831, and from the medical dept. 1834, but engaged in literary pursuits, and was interested especially in antiquarian studies. Though tracing his descent from 11 of the *Mayflower* Pilgrims, he was a devoted Roman Catholic. He was mayor of Boston 1868–70. Besides many genealogical sketches, he wrote *Epitome of Phrenology* (1835); *Perpetual Calendar for Old and New Style* (1848); *Passengers of the Mayflower in* 1620 (1849); *Records of the Governor of and Company of the Massachusetts Bay in New England,* 1628–1686, 5 vols. (1853–4); and edited with David Pulsifer *Records of the Colony of New Plymouth in New England,* 11 vols (1855–61).

SHUSHA, or SCHUSCHA, *shô'shâ:* fortified town of Russian Transcaucasia, in the govt. of Elisabetpol, 120 m. s.w. of the town of Schemacha. It was founded by Nadir Shah, and occupies a strong position on a mountain, accessible on only one side. Pop. (1880) 24,500; (1886) 26,806.

SHUSTAR, *shôs'tėr:* city of Persia, in Khuzistân, on the Karun, 30 m. e.s.e of Dizful, at the foot of a range of sandstone hills. In the early part of the 19th c. it was an important town, the cap. of the province; but it was nearly depopulated by an epidemic 1832, and was much damaged by inundation 1840. On a height stands the castle, commanded, however, by a loftier elevation. The walls have been allowed to fall, and a fourth part of the town is in ruins. Mackenzie found the town, 1875, wretchedly decayed and filthy. The houses are of stone, with underground rooms for refuge from the intense summer heat Customs are collected here, but the trade is small. Pop 6,000—8,000.

SHUT, v. *shŭt* [Dut. *schutten*, to shut in, lock up; *schieten*, to shoot, to drive forward; *schutdeur*, a sluice-gate: Low Ger. *schott*, a bolt: Bav. *schütten*, to fence round: Ger. *schützen*, to protect]: to close so as to prevent entrance or exit; to close or stop up for defense or security; to forbid entrance into; to contract, as the hand; not to keep expanded; to close itself; to be closed. SHUT'TING, imp. SHUT, pt. pp. *shŭt.* SHUT'TER, n. *-tér.* a cover for a window or opening. SHUT'TERED, a. *-tèrd*, furnished with a shutter or with shutters. To SHUT IN, to confine; to inclose. To SHUT OFF, to exclude; to prevent the passage of, as steam. To SHUT OUT, to exclude; to deny admission to. To SHUT UP, to close; to make fast the entrance of; to confine.—SYN. of 'shut, v.': to close; inclose; confine; prohibit; bar; exclude; contract.

SHUTTLE, n. *shŭt'tl* [AS. *scyttel*, a lock, a bar—from *sceotan*, to shoot: Norw. *skutul*, or *skyt*, a shuttle (see SHOOT)]: implement by which the thread is shot to and fro in weaving (see LOOM). SHUTTLE-BOX, case at the end of the race of a weaver's loom to receive the shuttle after having passed through the thread. SHUTTLECOCK [*cock*, supposed corruption of *cork:* according to Skeat, probably called *cock* from being stuck with feathers and flying through the air]: ornamental cork stuck with feathers, beaten forward and backward by a battledoor in play. SHUTTLE-RACE, a sort of shelf or ledge in a loom along which the shuttle passes.

SHUYA, *shô'yâ:* town of Russia, on the Teza river, 68 m. n.e. of Vladimir. It is connected by rail with Moscow and Nijni-Novgorod, and is an important centre of the cotton trade.—S. is mentioned 1403. Linen manufactures were established 1755, but the growth of the town has been since 1800. About 10,000 of its inhabitants are engaged in manufactures. In 1881 it had 12 cotton-mills, which produced cotton stuffs valued at $2,151,500, and cotton yarns worth $233,500. It is noted also for its tanneries. S. has a large cathedral with five gilt cupolas, built 1799.—Pop. (1870) 10,440; (1882) 19,560.

SHWAN-PAN, n. *shwŏn-păn:* a calculating instr. of the Chinese, similar to the Roman abacus.

SHY, a. *shī* [Ger. *scheu*, timorous; *scheuen*, to be afraid of: Dan. *sky*, shy, skittish: Sw. *skygg*, timid]: that is fearful of near approach; reserved; not familiar; avoiding free intercourse; wary; cautious; bashful: V. to start suddenly aside, as a horse; to take fright. SHY'ING, imp.: N. act of starting suddenly aside, as a horse from fear. SHIED, pp. *shīd.* SHIER, n. *shī'ėr*, one who shies. SHYLY, ad. *shī'lĭ.* SHY'NESS, n. *-nĕs*, fear of near approach; reserve; unsociableness.—SYN. of 'shy, a.': bashful; reserved; coy; timid; cautious; wary; suspicious; chary; jealous.

SHY, v. *shī* [Dan. *skieve*, to deviate, swerve (see also SKEW)]: to have a fling at; to try to hit: N. a fling at; a side-throw. SHY'ING, imp. SHIED, pp. *shīd.*

SI, *sē:* in *music*, the seventh note of the scale = B.

SIALAGOGUE, SIALAGOGIC: see SIALOGOGUE.

SIALOGOGUE, n. *sī-ăl'ō-gŏg*, or SIAL'AGOGUE, n. *-ă-gŏg* [F. *sialagogue*—from Gr. *sialon*, saliva; *agōgos*, leading—from *agō*, I lead]: medicine which increases the flow of saliva. SIAL'OGOG'IC, a. *-gŏj'ĭk*, promoting the flow of saliva.—*Sialogogue* denotes a substance which, by local stimulation, increases the secretion from the Salivary Glands (q.v.). Among such substances are Horse-radish root, Mezereon bark, and Pellitory root. Horse-radish root when chewed produces copious flow of saliva, and has been found useful in aiding deglutition in paralysis of the tongue. If Mezereon bark is used in the same way, the saliva should be frequently ejected, because of the acrid properties which it absorbs from the drug. Pellitory root is the best of this class of remedies. Fragments weighing half a dram to a dram may be frequently chewed to increase the flow of saliva in facial neuralgia, rheumatism of the muscles of mastication, and paralysis of the tongue.

SIAM, *sī'am* or *sē'am* (native name *Thái* = the Free, or *Muang Thái* = the Kingdom of the Free): kingdom, chief state of Indo-China; bounded s. by the Gulf of Siam and the Malay Peninsula (q.v.). On the w., n., and e., the frontier-line is ill defined and fluctuating, owing to many tribes being only partially under subjection, and to the constant wars of aggrandizement between S. and the Malayan and Burmese races on the w., and the Cambodian and Cochin-Chinese races on the east. According to a recent account, the country lies in lat. 4°—21° n., long. 96°—102° e.; is 1,200 m. in length, about 350 m. in extreme breadth; area calculated (1902) 236,000 sq. m.; pop. esti. 4 to 5 millions. The kingdom consists of 39 provinces, each governed by a Phraya, or functionary of the highest rank. There are numerous districts beyond the limits of the kingdom proper, as the Laos, Malayan, and Cambodian dependencies, which are more or less under subjection to S., and pay tribute generally once in three years. S. itself pays tribute to China, but only as a matter of usage and convenience, for it receives from that country more than a return, in the remission of duties on Siamese vessels bound to Chinese ports. Cambodia is between S. on the w. and Cochin-China; and as sovereignty over it has been claimed by both these countries, and as it has been too feeble to resist the claims, it has paid tribute to both. It is now held to be under a French protectorate: see CAMBODIA: COCHIN-CHINA: COCHIN-CHINA, LOWER.

Surface, Hydrography, Coast-line, Soil, and Climate.—The mountains which cover the n. districts, and form natural barriers along its e. and w. frontiers, are branches of the great system of the Himalaya. Though the n. dependencies of S. are mountainous, the kingdom proper is a vast plain, hilly only on its n. frontier. The great river of the country, the Nile of S., is called by foreigners Menam, or, more commonly, Meinam; but the Siamese call all rivers by this name, and distinguish the river by adding to the name Menam the name of the chief town or village on its banks; thus, Menam Bangkok is the river of Bangkok—that is, the great river of the country, which Europeans and other foreigners have agreed to call Meinam. This river, the great life-sustaining artery of the country, rises among the mountains of the Chinese province of Yunnan, whence it flows s. more than 800 m., and enters by three mouths, 6 to 8 fathoms deep, into the Gulf of Siam, about 30 m. (18 m. in direct line) below Bangkok. It receives a number of important affluents, notably the river Phitsalok, which joins it in lat. about 17° 35′ n. The annual inundation of the Meinam, the occasional non-occurrence of which entails failure on a great portion of the rice-crops, begins in June, and ends in Nov. Impregnated with the rich soil which it brings from the interior, its waters, in Aug., overflow the banks to a height sometimes exceeding six ft. above the ordinary level. The tract of country within the direct influence of the inundations is estimated at 12,000 sq. m.; but, properly speaking, the actual valley of the Meinam, beginning 450 m. above the mouth of that river, with average breadth of 50 m., has area of more than 22,000 sq. m., and forms a tract of country the fertility of which is not exceeded in any other part of the globe. Of the other great rivers, the chief is the Mei-kong, which flows through the e. districts, and is said to be 1,600 m. long. The coast-line, fringing the edge of the Gulf of Siam, may be roughly estimated at 1,100 m., exclusive of minor windings. The principal ports on the coast-line are Paknam (pop. 6,500), defended by three forts; Paklat, a few m. above Paknam (pop. 7,000), defended by a fort on each side of the river; Meklong, at the mouth of the river of the same name, long. 100° 10′ e., a beautiful city, with floating bazaars, fine pagodas and gardens (pop. 10,000); Chantaburi, long. about 103° e., near the mouth of a river which, though short, fertilizes with its inundations a considerable district, a place of active trade with China and Cochin-China (pop. 6,000); and Bangplasoi, 27 m. e.s.e. of Paknam, engaged in a profitable fishery and in agriculture (pop. 6,000). The breadth of the Malayan Peninsula, in lat. 11° n., is only 50 m., and here two streams, one flowing w. to the Bay of Bengal, the other e. to the Gulf of Siam, offer facilities for construction of a ship-canal, for, their sources being near each other, about 27 m. of canalization are all that would be required to connect them, and thus form a sea-way across the peninsula, which would shorten the voyage between India and eastern Asia by many days, and often by weeks. The estimated cost is $100,000,000; but the approaches through the river-mouths are intricate and unsatisfactory.—The climate of S. is, for a tropical region, salubrious; the resident missionaries speak highly in its favor. The mean temperature at Bangkok, for a series of eight years, was 81° 14′; the maximum heat, within the same space, was 97°, minimum 54°. Hurricanes and typhoons are almost unknown in S., though it is visited every year by the s.w. and n.e. monsoons—the former bringing clouds, thunder-storms, and rain, the latter bringing refreshing weather.

Agriculture, Flora, and Fauna.—In S., few of the instruments in use in scientific agriculture are known; and in many parts of the country, 1855, the ground was prepared for seed by turning herds of buffaloes into the fields to trample down the weeds and move the soil, and afterward by harrowing the ground with thorny shrubs. But the soil is so rich that the smallest outlay of capital and labor is rewarded by abundant harvests. A much more advanced system of agriculture has recently been introduced, and the quantity of agricultural products exported has greatly increased. Rice and sugar are principal crops. Of other products, the chief are *Aquila*, or eagle-wood, renowned for its perfume, and extensively used on that account at funerals, marriages, and other ceremonies in e. Asia; gutta-percha; cardamoms; gambege; bamboo; the rattan; valuable palms; the guava; mango; daurien, esteemed the king of fruits in S.; the mangosteen; and many other fruit and other trees, including teak and a variety of valuable ship and house timbers. Among the animals, the most famous is the elephant, which abounds in the forests. It is against the law of S. to kill elephants, as these animals are considered the property of the king; nevertheless many are slain for their tusks. A variety of this animal, said to be peculiar to S., is the white elephant, not really white, but of light mahogany color: this animal is held in the highest veneration, the cause of which is, that he is 'supposed to be the incarnation of some future Buddha, and will therefore bring blessings on the country which possesses so great a treasure.' He is fed on fresh grass, and sugar-canes and plantains served in rich dishes, is covered with ornaments, inhabits a building attached to the palace, enjoys the rank of nobility, and is tended by a staff of officers, guards, valets, etc. Tigers abound, especially in the Laos country in the n.; tiger-cats, rhinoceroses, boars, wild pigs, elks, and deer of many kinds tenant the woods. Crocodiles, lizards, and serpents of various kinds are numerous. Excellent fish are found on the coasts and in the rivers.

Minerals.—Gold is found among the mountains, and silver in combination with other metals; copper, tin, lead, and iron are abundant, and are extensively worked by the Chinese. Precious stones are in great number and variety.

Manufactures.—Vases, urns, and other vessels, in the manufacture of which gold is embossed on silver, are made here in great numbers, and have an oriental celebrity. Gold-beating, iron-founding, and manufactures of fine cloth, glass wares, and pottery are carried on.

Commerce, Exports, and Imports.—In former times, Bangkok (q.v.), the cap., was the most commercial city e. of the Cape of Good Hope, after Calcutta and Canton; and 60 British ships were engaged in trade with the river Meinam. But such had been the influence of bad legislation, and such the destructive progress of monopoly, tha. the foreign trade 1855 had become reduced almost to nothing. Sir John Bowring, Brit. plenipotentiary, arriving in S., negotiated a treaty of friendship and commerce with the Siamese rulers 1855, which provides that British subjects are permitted to trade freely in all seaports of S., may purchase lands, houses, etc., and may profess the Christian religion undisturbed. By this treaty, all monopolies are rescinded, British traders purchasing directly from the producer, and selling directly to the purchaser, without the interference of any third party. Export-duties are levied on all goods that leave the country, but they pay one impost only, whether this be levied under the name of inland-tax, transit-duty, or duty on exportation. Prior to 1856 the British arrivals amounted to only 12 per annum; in 1858 they amounted to 81 vessels; and in 1881 the entries at the port of Bangkok, centre of the foreign trade of S., included 268 British vessels (of a total of 524 vessels), of 110,625 tons. Total exports, 1876–80, had an annual value of from $8,000,000 to $11,000,000; imports $5,000,000 to $6,500,000. The trade with Britain fluctuates in an extraordinary manner: the chief articles exported were rice and sugar, and principal imports were iron and machinery. In 1889 the imports were $7,743,229; exports $11,111,320; revenue about $9,720,000; expenditure within revenue; no public debt. A small standing army was maintained, and there was a general enrolment of males as militia. The navy consisted of 4 steam corvettes and 12 gun boats. The val. of im., 1901, chiefly treas, cotton goods and opium, was $13,718,336; of ex., chiefly rice and teak, $21,355,178.

Inhabitants and Government.—The Siamese proper, that is, the Thái race, form about a third of the entire population. 'They are gentle, timid, careless, and almost passionless.' They differ in several respects from many eastern nations. Lying, though frequently resorted to as a protection against injustice and oppression, is not a national characteristic. The Siamese are inclined to be idle, inconstant, and exacting; but they are sincere, very affectionate in their domestic relations, witty in conversation, and, like the Chinese, expert in mimicry. About a third of the whole population are Chinese, who are great emigrants, but who, wherever they go, preserve their own language, customs, costume, habits, and social organization. There are, it is estimated, 1,500,000 Chinese in S.; in Bangkok alone 100,000. All the active business of the country is in their hands. The Laos people (see SHAN STATES) also are very numerous in the country, and there are considerable numbers of Malays and Cambodians. The religion of the Siamese is Buddhism (q.v.), which inculcates the highest veneration for life in whatever form. A Siamese will not kill vermin or serpents; and the tameness of many creatures that in Europe flee from the presence of man is observed by all strangers. The use of Betel (q.v.) is almost universal. All the *belles* of S. stain their teeth black. The Siamese are extremely ceremonious in intercourse one with another. An inferior crouches and crawls on the ground before a dignitary, and speaks of himself as 'your slave—a hair—a little beast.' They are a small, well-proportioned race, with olive-colored skin and black hair, of which all that they allow to grow is a tuft about two inches long on the top of the head—the rest being shaven off. They are remarkably fond of jewelry and ornaments; and the apparel of the higher functionaries and nobles is splendid and beautiful. They are fond of music; have a number of good native instruments, as well as the common European ones; and are skilful performers.

The government is an absolute and hereditary monarchy, and there are two kings. The First King is the actual monarch; the Second King, who receives about one-third of the revenue and has an army of 2,000 men, seems to occupy the place of first counselor, and is invariably consulted by the first king before any decisive step in administration of affairs. The present (1891) first king, Phrabat Somdetja Phra, commonly known as Chulalongkom the First, b. 1853, Sep. 21, ascended the throne on his father's death, 1868. The late sovereign was an enlightened and accomplished man, notable for attainments in science. Since a decree of 1874 the king shares the legislative power with the supreme council of state and with his cabinet or Senabodi.

History.—The annals of the Siamese begin about five centuries B.C. But nothing authentic is known of the history of the country till 1350, in which year Ayuthia, the former cap., was founded. Cambodia was conquered 1532, and in the same century the Siamese dominion extended to Singapore. The present dynasty ascended the throne 1782. There have been Prot. and Rom. Cath. missionaries in S. since 1828. Under the auspices of the Calcutta Auxiliary Bible Soc., the New Test. has been translated into Siamese, and was pub. 1846.—See Bowring's *Siam* (1857); works by Pallegoix, Bréhan, Reclus (1883); by the Germans Bastian and Scherzer; by the Americans Bacon and Vincent; and Karl Bock's *Temples and Elephants* (1883).

SI'AM, GULF OF: important arm of the Chinese Sea, bounded n. and w. by Siam, s.w. by the Malay Peninsula, n.e. by Cambodia. At its entrance between Cambodia Point and the peninsula of Patani, on the Malay Peninsula, it is 235 m. wide; and from a line between these points it extends inland n.w. to the mouth of the Meinam, 450 m. Four great rivers, navigable to a considerable distance from their mouths, and the chief of which is the Meinam (see SIAM), fall into the gulf. It is unvisited by hurricanes, and shipwrecks here are rare.

SIAMESE TWINS, *sī-a-mēz* or *-mēs:* two individuals, Eng and Chang; born of Chinese parents in Siam 1811; died 1874; having their bodies united by a band of flesh stretching from the end of one breast-bone to the same place in the opposite twin. The survival to advanced life of such a *lusus naturæ* makes this one of the most remarkable cases on record. A union of the bodies of twins by various parts is not unusual (see Monstrosity). Ambrose Paré has depicted instances of union by the back, belly, and forehead The last occurred in two girls, who lived to the age of ten years, when, one of them dying, a separation was made: the wound of the living girl assumed a bad character, and soon proved fatal. The Hungarian Sisters, who lived about a century since, were united by the back, had one passage from the intestines, and each had one from the urinary organs. They died when they were 22 years of age. The Siamese Twins were purchased of their mother at Meklong, a city of Siam, and were brought to the United States by Capt. Coffin and Mr. Hunter 1829. On examination, the connecting band seemed to have united them at first face to face, but constant traction had so changed its direction that they stood partially side by side. Its length above was about two inches; below, nearly four; from above downward it measured three inches, and its greatest thickness was one and a half inch. It was covered with skin; and when the centre was touched, both felt it; but on touching either side of the median line, only the nearest individual was sensible of it. The connection between the Siamese Twins presented many interesting points in regard to physiology and pathology; for though they formed two perfectly distinct beings, they appeared most frequently to think, act, and move as one individual.

After realizing a competence by exhibition of themselves in various countries of Europe, the S. T. settled in one of the southern United States, where they were married to two sisters, and had offspring. Owing to domestic quarrels, however, two houses were found necessary—each living with his wife a week at a time alternately. Impoverished by the civil war, the S. T. again made the tour of Europe, and exhibited themselves to the public. They died 1874, the one surviving the other an hour or two only.

For a full account of the structural peculiarities of such cases, see St. Hilaire's *Histoire des Anomalies de l'Organisation d'Homme et des Animaux.*

SIARA′: properly, Ceara (q.v.).

SIB, or Sibb, a. *sĭb* [Goth. *sibja,* relationship: OHG. *sibba,* affinity: AS. *sib,* kindred, peace]: in *OE.* and *Scot.,* related; of kin.

SIBBALD, *sĭb'ald,* Sir Robert: Scottish naturalist: 1641, Apr. 15—1722 (prob.): b. Edinburgh; of a good family in Fife. He studied at the Univ. of Edinburgh, pursued medical studies at Leyden, Paris, and Angers, and settled as physician in Edinburgh 1662. He applied himself to science, especially botany and zoology, and was appointed by Charles II. geographer for Scotland. His chief work is *Scotia Illustrata, sive Prodromus Historiæ Naturalis,* etc. (fol. Edin. 1684).

SIBBENS, *sĭb'ĕnz,* or Sivvens, n. *sĭv'ĕnz:* name given in the w. of Scotland to a cutaneous disease, the nature of which is little known; in *Orkney,* a name for the itch.

SIBERIA, *sī-bē'rĭ-a:* vast territory in n. Asia, belonging to Russia In England the name is generally applied to all the Russian possessions in Asia, except the Transcaucasian and Armenian provinces: S. so defined is bounded n. by the Arctic Ocean; e. by the seas of Kamtchatka, Okhotsk, and Japan, arms of the Pacific Ocean; w. by the Ural Mountains, Ural river, and Caspian Sea. The s. boundary is made to include the recent Russian acquisitions in Turkestan, and runs from Lake Issyk Kul n.n.e., then e. by Kiahta to the Argun river, which it follows to the Amur; the latter it follows to long. 135° e., where it trends s.w., ascending the Usuri tributary 200 m., then running straight to the sea at the n. frontier of Corea. In the official language of Russia, however, S. has not such extent. The Russian possessions in Turkestan form a separate division under the name CENTRAL ASIA, and to this portion of the empire the govts. Akmollinsk, Semipalatinsk, Turgai, and Uralsk are now attached. Geographically speaking, these govts. belong to S.; as do also considerable areas e. of the Ural Mts., which for administrative purposes form part of the European govts. of Perm and Orenburg. This article deals mainly with the region officially termed S.: for Russian possessions in the Turkestan territory, see ASIA, CENTRAL. The following are the subdivisions or govts. of Siberia:

Province.	Area in square miles.	Population (1897).
Tobolsk	539,669	1,438,484
Tomsk	331,159	1,929,092
Irkutsk	287,061	506,517
Transbaikalia	236,868	664,071
Yakutsk	1,533,397	261,731
Yeniseisk	987,186	559,902
Amur (1881)	172.848	118,570
Primoeskaya	715,982	220,557
Sakhalin (1894)	29,336	23,166
Total	4.833.496	5,727,090

(With Central Asia, but excluding the Caucasus, the total area of Rus. Asia is nearly 6,000,000 sq. m.; pop. 14,500,) 000.) It thus appears that in S. proper there are about three inhabitants to every four Eng. sq. m. The n. and e. shores are very irregular in form, jutting out frequently into bold peninsulas and promontories, and indented with numerous immense inlets, chief of which are the estuaries of the Obi (575 m. in length) and of the Yenisei, the Gulf of Anadir, and the Sea of Okhotsk. All the island groups n. of S., and since 1875 the whole of Sakhalin or Saghalien on the e. coast, belong to S.; whereas since 1875 all the Kurile Islands are Japanese. The Liakhoff group, near the mouth of the Lena, consists of three islands, 60 to 100 m. long by 20 to 40 broad, and of numberless islets: they are completely barren, and present in their soil and subsoil alternate layers of sand and ice, in which are imbedded the remains of animals. The northernmost point of Siberia and of the old world is Cape Chelyuskin, or Northeast Cape. Prof. Nordenskjöld, who 1878-9 sailed along the whole coast of S. from e. to w., found Cape Chelyuskin to be in lat. 77° 41′ n. A country of such vast extent as S. (greatly larger than Europe) must necessarily have great varieties of climate; accordingly we find in the n. regions, much of which lie far within the Arctic circle, an extensive tract bordering on the ocean, composed of swamp, moorland, and mossy flats, covered with snow and ice for half of the year, and even during the greatest heats of summer released from its icy bonds only to the depth of a few inches below the surface. The ocean, its n. boundary, is frozen for miles seaward during more than half the year, and during the remaining months the numberless icebergs and floes which crowd the sea, and continually come into collision, render the navigation so dangerous that no complete hydrographic survey of the coast has yet been made. On the s. boundary of this semi-barren zone, stunted, misshapen bushes and trees are found; and as we advance s., vegetation appears in the form of extensive forests of birch, fir, and larch, which clothe the plains and hill-sides, and are interspersed with stretches of pasture of moderate quality. After crossing the parallel of lat. 64° n. in west S., and that of lat. 61° n. in east S., the more hardy cereals, barley, oats, and rye, begin to appear, and the soil increases in fertility, sometimes to an extraordinary extent, thick woods of Siberian cedar and other trees clothe the mountain-sides, and the valleys, especially along the banks of rivers, are under cultivation. The whole of western S. is one great plain, sloping from its s. boundary, where the average elevation is 2,000 ft., northward to the Arctic ocean, except the small corner in the s.w., which is drained into the Caspian and Aral seas. The fertility of a great portion of the govts. of Tobolsk and Tomsk, especially of the *Baraba* and *Ishim* steppes, is proverbial, and they are the great granaries of Russia and n. Europe. But the warmest and perhaps most fertile part of western S. is the valley of the Yenisei, n. of the Sayansk Mts. Eastern S. is more hilly and less fertile than the w. portion, but the valleys and hill-sides afford good pasture. Four-fifths of S. is drained by the three immense rivers Obi (q.v.), Yenisei, and Lena (q.v.), and by a number of smaller rivers, all flowing to the Arctic Ocean. S. has a large number of lakes, some of which are little else than salt-marshes; the largest are Lake Baikal (q.v.) and Lake Balkash (q.v.). The chief mountain range of S. is the Altai chain, which forms the s. boundary toward Mongolia, and ramifies e. and n. from the region of Lake Baikal, covering a large portion of the surface of eastern S. East of Baikal, the continuation of the Altai is rather a lofty table-land, running to Behring Strait, with many nearly parallel ridges: this plateau is the 'Great Divide' between the Lena and the Amur. The best-defined and loftiest range is the Yablonovoi Mts., or section of the Stanovoi Mts., culminating on the frontier in a peak 8,370 ft. high. Farther e. is the Stanovoi proper. Lofty mountain chains traverse the island of Saghalien and the peninsula of Kamtchatka, in which are 21 active volcanoes—the loftiest, Kliutshewsker, 15,000 ft. Among wild animals of S. are the reindeer in the n. flats and on the high mountains of the s.; the arctic or black fox and white bear in the n.; the sable, ermine, marmot, marten, squirrel, Caspian antelope, and wild sheep—all in the s.; and the lynx, wolf, wild boar, and glutton are generally diffused. Camels are found among the Kirghis, with the broad-tailed sheep, the Russian sheep also being domesticated in S.; and horses of good quality, an inferior sort of cattle of the Russian breed, and a large wolfish looking dog, used chiefly to draw sledges, complete the list of domestic animals. Fresh and salt water fish abound, and feathered game is plentiful in the south. The mineral wealth is great: gold, silver, copper, and lead are found in all the mountainous districts on the w. and s.; platinum, iron, and precious stones, including diamonds, are found on the e. slopes of the Ural; zinc, antimony, arsenic, plumbago, and valuable emerald and topaz mines are worked in the districts n. of the Amur; and porphyry, malachite, jasper, and salt (from the steppes) are common. The great majority of the inhabitants of the central and w. provinces are Russians and Poles, or of Russian and Polish descent, and these have been sent to the country either as exiles, on account of political or criminal offenses, or as govt. colonies. The most abandoned class of exiles are kept to hard labor in the mines; others are put to less laborious but still compulsory work; a third portion are settled in specified districts, under surveillance of the police, and allowed to employ themselves as they choose. This last class employ themselves chiefly in trapping those animals whose skins and furs are valuable articles of trade. In the n.w. are found the Samoieds, and adjoining them the Ostiaks, both of whom live by hunting and fishing alone. In the s. are the nomad tribes of the Kirghis (q.v.) and Kalmucks (q.v.), both cattle-breeding peoples, though the latter have now partially adopted a settled mode of life, and manufacture iron and gunpowder. Next to them, on the borders of Manchuria, are the Buriats, a people of Mongol origin, the most numerous tribe in S.; to the n. of whom are the Yakuts and Tunguses, of Tartar origin, who are spread over the whole of eastern S. from the town of Irkutsk to the Stanovoi range, and live mostly by hunting. The Tchuktchis, an Esquimau race, and the Koriaks inhabit the n.e. corner, and the Manchus are the population of the Amur territory. Manufactures are unimportant and confined to the principal towns; the barter-trade in European goods is carried on at Obdorsk, Ostrovnoe, Yakutsk, and Petropavlovsk; and the transit-trade with China through Kiahta (q.v.), imports from China being tea of the finest quality, sugar, silk, cotton, wool, grain, fruits, etc.; and exports to that country, cotton and woolen cloths, linen, furs and skins, leather, and articles of gold and silver. The exports to Russia are the natural produce of the country, and are transported w. to the frontier by alternate land and river carriage to Tobolsk, thence over the Ural Mountains to Perm. Reindeer sledges are the usual means of transport in winter. Fairs are held at stated periods in certain localities, and much of the trade of the country is there transacted. The chief towns in Siberia proper (1897) are Tobolsk, pop. 20,427; Tjumen, 29,585; Tomsk, 52,430; Irkutsk, 51,434.

S. seems to have been made known to the Russians first by a merchant named Anika Stroganoff; and soon afterward the conquest of western S. was effected by the Cossack Vassili Yermak, an absconded criminal, at the head of a numerous band of wild followers. After Yermak's death 1584, the Russians pursued their conquests eastward, founding Tomsk 1604; and though they often experienced serious reverses, their progress was rapid, the Sea of Okhotsk being reached 1639, and Irkutsk founded 1661. Frequent disturbances have occurred between the Russians and the Chinese and Tartars, which have resulted in the extension southward of the Siberian boundary into Manchuria and Turkestan (q.v.). In 1845 the left bank of the Amur became Russian. In 1858 the frontier was extended along the seaboard s. of the river to the frontier of Corea. The Russians have now a large number of steam-vessels on the Amur. Recent voyages of exploration point to the practicability of opening direct and extensive commerce between Archangel and the rivers Obi and Yenisei. The Lena also is navigable for a great distance from its mouth. During the last 250 years, more than 1,000,000 exiles have gone to S., if we include women and children accompanying their banished relatives. The yearly average is 8,000 or 9,000. Accounts as to their treatment vary greatly; some affirming that all are fairly used; some, that they, even political exiles, are very harshly dealt with. Recent statements by the accomplished and observant explorer George Kennan (q.v.) throw a fearful light on the sufferings which the Russian govt. either inflicts or permits on the part of multitudes of its state prisoners whom it condemns to Siberian exile.—The manufacturing industries of S. are developing slowly; its mines are extensively wrought; but agriculture is practiced only by the Russian settlers. In 1891 the govt. fixed the route of a great railroad, which was begun in May of that year, and completed in Dec., 1901. The line connects at Samara with the line passing through Moscow from St. Petersburg, crosses the Ural Mountains between Ufa and Zlatoust, passes through Omsk, Tomsk, Irkutsk to Kottomangoo on the Ural, thence s.e. to Khabarovka on the Ural, and then nearly s.w. to Vladistock on the Sea of Japan; a branch connects with the commercial terminius, Dolny near Port Arthur. The cost was $172,525,000, the total dstance, St. Petersburg to Vladistock is 6,666 m.—See Eden's *Frozen Asia* (1880); Lansdell's *Through Siberia* (1882); Kennan's *Tent Life in Siberia* (1870), and *Siberia and the Exile System* (2 vols. 1891).

SIBERIAN, a *sī-bē′rĭ ăn*: pertaining to *Siberia* or Asiatic Russia; bleak; northern. SIBERIAN DOG, n. variety of the Esquimau dog, of large size and more docile temper.

SIBILANT, a. *sĭb'ĭ-lănt* [F. *sibilant*—from L. *sibilans* or *sibilan'tem*, hissing; *sibĭlārĕ*, to hiss—from *sibĭlus*, a hissing]: making a hissing sound: N. a letter uttered with a hissing sound, as *s*. Sib'ilance, n. *-ĭ-lăns*, or Sib'ilancy, n. *-ĭ-lăns-ĭ*, the quality or characteristic of being sibilant. Sib'ila'tion, n. *-lā'shŭn*, utterance with a hissing sound; a hissing sound.

SIBLEY, *sĭb'lĭ*, Henry Hastings, ll.d.: 1811, Feb. 20—1891, Feb. 18; b. Detroit: pioneer and soldier. He received a classical education and began the study of law, but turned to mercantile business at Sault Sainte Marie, and soon afterward entered the service of the American Fur Co. at Mackinaw and Fort Snelling, and eventually became a member of the company. He settled in Minn. while it was a territory, and was its delegate in congress 1849–53, and a member of the constitutional convention 1857. On its admission as a state 1858, he was chosen its first gov. In 1862, Aug. and Sep., he commanded the successful expedition against the Sioux Indians, and Sep. 23 was commissioned brig.gen. of vols., and later brevetted maj.gen. In the early days of Minn., Gen. S. wrote graphic sketches of frontier life for the *Spirit of the Times* and *Turf, Field, and Farm.*

SIB'LEY, Hiram: financier: 1807, Feb. 6—1888, July 12; b. North Adams, Mass. In early life he was engaged in manufacture of machinery; but was interested in telegraphy, and largely through his efforts congress made an appropriation to assist Morse in his experiments. When telegraphy became a fixed fact, S. was among the first to organize a telegraph company. In 1856 he, with a number of other business men, bought up the smaller companies, and consolidated them into what is now the Western Union Telegraph Co., and was its first pres., holding the position many years. He founded the Sibley College of Mechanic Arts of Cornell Univ., Sibley Hall of the Rochester Univ., and gave liberally to public and private charities. He died at Rochester, N. Y.

SIB'LEY, John Langdon: librarian: 1804, Dec. 29—1885, Dec. 9; b. Union, Me. He graduated at Harvard 1825; studied at the divinity school; was assistant librarian 1825–6, again 1841–56; librarian 1856–77; librarian emeritus 1877–85. In 1829 he was ordained pastor of a Unitarian church at Stow, Mass., serving till 1833. In 1837 he became ed. of the *American Magazine of Useful and Entertaining Knowledge*, and later its proprietor. He edited the triennial, quinquennial, and annual catalogues of Harvard, and wrote biographies of early graduates of Harvard. He gave $39,000 to Phillips Exeter Acad. for aid of poor students. He died at Cambridge.

SIBTHORPIA, n. *sĭb-thŏr'pĭ-ă* [after Dr. *Sibthorp* of Oxford]: a greenhouse plant, of a singular and interesting appearance. ord. *Scroph'ularĭācĕæ.*

SIBYL, n. *sĭb′ĭl* [L. *sĭbyl′la:* Gr. *sĭbul′la;* according to the old derivation, from *Dios boule*—Doric, *Sios bolla,* will or counsel of God]: name given to certain women who in ancient times and different countries professed to be inspired as prophets: gypsy; fortune-teller. SIB′YLLINE, a. *-lĭn,* uttered or composed by Sibyls; pert. to the Sibyls. SIB′YLLIST, n. *-ĭst,* believer in the Sibylline prophecies.—*Sibyl* is the designation of several supposed prophetic women whose history has come down to us in wholly mythical form. Their number is differently given; Aristophanes and Plato seem to know of one only: so too the author of the Greek work *Thaumasia Akusmata.* Heraclides of Pontus, disciple of Plato, mentions three—Erythræan, Phrygian, Hellespontine; Pausanias four; later writers give the names of 2, 3, 4, 8, 10, and 12 Sibyls. But in general 10 are reckoned: the Babylonian, Libyan, Delphian, Cimmerian, Erythræan, Samian, Cumæan, Trojan or Hellespontine, Phrygian, and Tiburtine. Of these, by far the most celebrated is the Cumæan, identified by some ancient authors with the Erythræan, and personally known by the names Herophile, Demo, Phemonoë, Deiphobe, Demophile, and Amalthæa. She figures prominently in the 6th book of Virgil's *Æneid,* as the conductor of the poet into the realm of the shades. The Roman legend concerning her (as recorded by Livy) is, that she came from the East, and appearing before King Tarquin the Proud, offered him nine books for sale. The price demanded appeared to the monarch exorbitant, and he refused to purchase them. She then went away, destroyed three, and, returning, asked as much for the remaining six as for the nine. This was again refused, whereupon she destroyed other three, and once more offered to sell him the rest, without abatement of the original price. Tarquin was struck by her pertinacity, and bought the books, which were found to contain advices regarding the religion and policy of the Romans. They were preserved in a subterranean chamber of the temple of Jupiter on the

Sibyl of Delphi.

Capitoline, and were originally intrusted to two officials (*duumviri sacrorum*) appointed by the senate, who alone had the right to inspect them. The number of keepers was afterward increased to 10 (*decemviri*), and finally by Sulla to 15 (*quindecemviri*). B.C. 83, the temple of Jupiter having been consumed by fire, the original Sibylline books or leaves were destroyed, whereupon a special embassy was dispatched by the senate to Erythræ, to collect the oracles anew: they brought to Rome about 1,000 verses, which, with others brought from Ilium, Samos, Sicily, Italy, and Africa, were deposited in the temple of Apollo Patrous in the 12th year of the reign of Augustus. It is believed that they were burned by Stilicho about A.D. 400. Besides these 'genuine' oracles, there were spurious collections, as appears from the fact that by order of Augustus a great many such were burned. It is beyond doubt that as early, at least, as the 2d c. after Christ, when enthusiastic men sprang up in the Christian Church, prophesying in a poetic-oracular style (whence they were sometimes called *Sibyllists*), the Sibylline books were much interpolated and falsified to assist the progress of the new faith. The utterances of these Christian Sibyllists form a special department of early ecclesiastical literature, and are a mixture of Jewish, Pagan, and Christian ingredients: the collections of them also bear the name Sibylline Verses or Sibylline Books. In the *Dies Iræ* 'the Sibyl' is quoted with David as authority for the belief in a final destruction of the earth by fire—*teste David cum Sibylla.* An ed. of the *Oracula Sibyllina* was published by Gallæus 1689.—See works on the Sibylline Books by Bleek (1819), Volkmann (1853), Ewald (1858).

SIC, ad. *sĭk* [L. *sic*, so, thus]: a word which, when placed within brackets immediately after a quoted word or expression, indicates a difference of opinion with the author or speaker, and expresses something between a doubt and a sneer, as saying 'can this be correct?'

SICCAR: see SICKER.

SICCATIVE, a. *sĭk'ă-tĭv* [L. *siccātus*, dried up; *siccārĕ*, to dry—from *siccus*, dry]: drying; causing to dry: N. that which promotes drying.

SICE, n. *sīs* or *sīz* [F. *six*, six—from L. *sex*, six]: the number six at dice.

SICH, a. *sĭch:* OE. for SUCH.

SICILIAN, a. *sĭ-sĭl'ĭ-ăn:* of or relating to Sicily, an island s. of Italy.

SICILIANO, *sĭ-sĭl-ĭ-â'nō*, It. *sē-chē-lē-â'nō*, or SICILIA'NA, *-nâ*, in Music: slow, soothing, pastoral air, in 6-4 or 6-8 time; so called because the dance peculiar to the peasantry of Sicily possesses this character.

SICIL'IAN VES'PERS: name given to the massacre of the French in Sicily, on the day after Easter 1282, Mar. 30, the signal for whose commencement was to be the first stroke of the vesper-bell. Charles of Anjou, brother of Louis IX. of France, had deprived the Hohenstaufen dynasty of Naples and Sicily, and parcelled out these kingdoms into domains for his French followers; but his cruelty toward the adherents of the dispossessed race, his tyranny, oppressive taxation, and the brutality of his followers, excited among the vindictive Sicilians the deadliest animosity (see NAPLES: KONRADIN: MANFRED: ETC.). The aged Giovanni da Procida, a steady partizan of the Hohenstaufen family, took the lead in directing and systematizing a conspiracy against Charles and his followers; and after a visit to Pedro of Aragon (husband of Constance, the cousin of Konradin, and next heir to Naples and Sicily), whom he found willing to undertake the conquest of Sicily, he returned to his self-imposed duty in the island. On the evening of Easter-Monday, the inhabitants of Palermo, enraged (according to the common story) at a gross outrage by a French soldier on a young Sicilian bride, precipitated the accomplishment of the scheme by suddenly rising upon their oppressors, putting to the sword every man, woman, and child of them, not sparing even those Italians and Sicilians who had married Frenchmen. This example was followed, after a brief interval, by Messina and the other towns, and the massacre soon became general over the island: the French were hunted like wild beasts, and dragged even from the churches, where they vainly thought themselves secure. More than 8,000 of them were slain by the Palermitans alone. Only one instance of mercy shown to a Frenchman is on record. The gov. of Messina also succeeded in passing the strait with his garrison before it was too late. The 600th anniversary of the Sicilian Vespers was celebrated with much enthusiasm 1882, Garibaldi (shortly before his death) having come to Palermo to be present. He was, however, too feeble to take part in the ceremonies.—See Amari, *La Guerra del Vespro Siciliano*.

SICILY, *sĭs'ĭl-ĭ:* largest, most fertile, and most populous island in the Mediterranean Sea; lat. 36° 38′—38° 18′ n., and long. 12° 25′—15° 40′ e.; separated from the mainland of Italy by the Strait of Messina. Its shape roughly resembles a triangle (whence the early Greek navigators gave it the name of *Trinacria,* 'Three-cornered')—the e. coast, from Capo del Faro in the n. to Capo Passaro in the s., forming the base; and the n. and s.w. coasts the sides, which gradually approach each other toward the n.w. The length of the base is 145 m.; of the n. side, 215 m.; and of the s.w., 190 m.: circumference of the island, including the sinuosities of the coast, estimated 624 m.; area about 10,000 sq. m. Pop. (1890) 3,285,472; (1901) 3,529,799. Capo Passaro, at the s.e. extremity, is only 56 m. from Malta; and Capo Boco, near Marsala, at the n.w., only 80 m. from Cape Bon on the African coast.

Physical Geography.—The island of S., like the mainland of Italy, is traversed throughout its entire length by a chain of mountains, which may be regarded as a continuation of the Apennines (q.v.). This chain, beginning at Capo del Faro on the Strait of Messina, runs s.s.w. as far as Taormina, where it turns off to the w., and stretches across the whole island, keeping, however, much nearer the n. than the s.w. coast. The first part of the chain, from Capo del Faro to Taormina, is called the Peloric range (anc. *Neptunius Mons*), which in Monte Dinnamare attains the height of 3,260 ft.; the second and much the longer part is called the Madonian range (anc. *Nebrodes Montes*), which in the Pizzo di Palermo rises 6,328 ft. It forms the great water-shed of the island. Toward the n.w. coast, the chain breaks into irregular, often detached masses—e.g., Monte Pellegrino (1,963 ft.) and Monte San Giuliano (2,184 ft.). About the centre of the chain, a range branches off through the heart of the island to the s.e.—at first wild and rugged, afterward smoothing down into table-lands, which in turn slope away tamely to the sea. There are innumerable other spurs to the s. from the great Madonian chain, of inferior length and elevation. For the volcano of Etna which rises in solitary grandeur on the e. coast, see Etna. S. is not, on the whole, a well-wooded country, but some forests of considerable size are found—e.g., the royal forests near Caronia and Mezzojuso, the forest-zone of Etna, etc.—In the interior there is not much level land, but on several parts of the coast are extensive plains, generally of great fertility. The principal of these are the great plain of Catania (anc. *Campi Leontini*), out of which rises Etna; the plains of Palermo, termed the *Conca d'Oro,* or 'Golden Shell,' of Castellamare, of Licata, and Terranova. —Although rivers are numerous, none are navigable. The largest are the Simeto or Giarretta, the Cantara, the Salso, the Platani, and the Belici.

Climate.—The climate of S. is very warm, but salubrious, except in low-lying places, where there is a mephitic atmosphere. The best health is enjoyed in the lower region of Etna, which is very densely peopled, though exposed to eruptions and violent earthquakes. The heat is intense in summer when the sirocco blows. After the autumnal equinox, violent winds are prevalent, torrents of rain fall, and all along the coasts the atmosphere is charged with moisture and fogs. The earthquakes begin about the end of winter, and do great damage. Snow and ice are rarely seen, except on Etna.

Geology and Mineralogy.—The primary rocks in the mountainous districts are chiefly quartz, granite, and mica. In some parts these are overlaid by limestone rocks. Most of the lower ranges of hills are of calcareous formation, and rich in metallic ores. Sulphur forms the chief mineral wealth: immense beds of it are in the central and n. parts of the island. The mines are worked by Cornish miners and their descendants.

Soil, Agriculture, etc.—The soil is so fertile that little labor is required to raise the crops. In many valleys there is rich soil to the depth even of 40 ft. In Catania, decomposed lava is spread over the ground, greatly increasing its fertility. The crops of grain are large, and might be prodigious if agriculture were better understood; the harvests are such that they recall to mind the words of Livy, in speaking of S.: 'Populoque Romano, pace ac bello, fidissimum annonæ subsidium' (lib. xxvii. 5). In the most ancient times, agriculture was sedulously prosecuted, but it began to decline when the island was deprived of its independence by the Carthaginians. In more recent times, the restrictions on the exportation of grain served to retard not only agriculture, but also commerce, which, on every attempt at advance, was met by fresh obstacles in the shape of new taxes. The Italian govt. has greatly alleviated the obstacles to agriculture, and the salutary effects of the change of system are already apparent. The soil produces corn, maize, flax, hemp; excellent cotton near Mazzara and in Catania; sugar, equal to that of the E. Indies, along the s. coast; grapes (350,000 acres), olives (125,000 acres, with annual yield in oil of 15,000 tuns), saffron, oranges, lemons, citrons, pomegranates, figs, pistachios, dates, castor-oil, mulberry, sumach, tobacco, and manna. The vine has been cultivated with the greatest care at Marsala since 1789, when an English firm settled there began to export it. Now more than 5,000,000 gallons are annually exported to England, America, and India.—S. has the best tunny-fisheries in the Mediterranean. The fisheries for coral obtain, on an average, about 2,100 lbs.

Manufactures, Commerce, etc.—The manufactures are insignificant, and nearly confined to silk, cotton, and leather.—The most important articles of export are sulphur, sumach, fruits, and wine; of import, cottons, woolens, silks, linens, earthenware, hardware. Great Britain, France, and the United States are chiefly the countries with which the Sicilians carry on commerce. The statistics of exports and imports are untrustworthy; but the latter considerably exceed the former. More than 200 m. of railways have recently been constructed.

Religion, Education, etc.—Except about 58,000 Greeks and a few thousand Jews, the inhabitants are Rom. Cath.;

but though equally ignorant, they are not so superstitious as the Neapolitans; at least their superstition has not destroyed their love of political freedom, as has repeatedly been evinced in their history—most recently in the ardor with which they responded to the summons of Garibaldi to liberate themselves from the tyranny of the Bourbons. There are three universities—at Palermo, Catania, and Messina; also a Collegio de' Nobilé at Palermo.

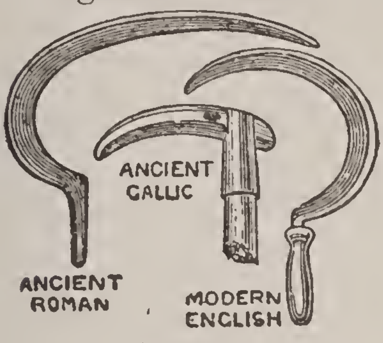
Political Divisions.—S. is divided into 7 provinces or prefectures—Palermo, Messina, Catania, Noto or Siracusa, Caltanisetta, Girgenti, and Trapani. Each province is subdivided into 3 or 4 districts, and these again into numerous *communi* or 'townships.' Over the province is placed an *intendente,* or, as he is now called, a 'prefect;' over the district, a sub-prefect; and over the commune, a *sindaco* ('syndic,' or 'mayor'). The prefect presides over every dept. of the provincial administration, also over the provincial council of 15 to 20 land-holders, who meet once a year, and sit 20 days, examining the accounts of the province, and framing the provincial budget. The two subordinate divisions also have their 'councils;' and the members of all three are appointed by either the king or the prefect. Of course this insular self-government does not supersede the necessity of sending Sicilian deputies to the national parliament at Rome.

History.—S. was inhabited, in pre historic times, by a people who bore the name *Siculi* or *Sicani,* and who—according to a universally received tradition—crossed over into the island from the s. extremity of the mainland. Their names and every fact that we can ascertain about them lead to the supposition that they were members of the great Latino-Italian family that, entering Italy from the n., gradually pushed its way across the Apennines to the peninsula of Bruttium (see ROME). Beyond this rational conjecture, however, we cannot proceed, and the actual history of S. begins to emerge out of utter darkness with the establishment of Greek and Phœnician colonies. The earliest Greek colony, Naxos, was founded B.C. 735; the latest, Agrigentum, B.C. 580. During the intervening century and a half, numerous important colonies were established (either directly from Greece or as offshoots from the older Greek settlements in the island): Syracuse B.C. 734, Leontini and Catana B.C. 730, Megara Hyblæa B.C. 728, Gela B.C. 690, Zancle, later Messana (date uncertain), Acræ B.C. 664, Himera B.C. 648, Mylæ (date uncertain), Casmenæ B.C. 644, Selinus B.C. 628, Camarina B.C. 599. The earlier history of these cities is almost unknown. What is recorded is vague and general. We read that they attained great commercial prosperity; that they subjugated, or wrested from the Siculi, Elymi, and other 'native' tribes, large portions of neighboring territory; and that their governments (like those of the republics in the mother country) were at first oligarchical, and latterly democracies or 'tyrannies;' but not till the period of the 'despots' have we detailed accounts. Then the cities of Agrigentum and Gela acquire prominence—the former, under the rule of Phalaris (q.v.), becoming, for a short time, probably the most powerful state in Sicily; and the latter, under a succession of able tyrants, Cleander, Hippocrates, and Gelon (q.v.), forcing into subjection most of the other Greek cities. Gelon, however, transferred his government to Syracuse (one of his conquests), which now became the principal Greek city of Sicily—a dignity that it ever after retained. Contemporary with Gelon, and possessed of the same high capacity for governing, were Theron, 'tyrant' of Agrigentum, and Anaxilaus, tyrant of Rhegium, and conqueror of Zancle, to which he gave the name Messana. Meanwhile the Carthaginians —a people wholly different from the Greeks in language, religion, origin, and civilization—had obtained possession of the Phœnician settlements in Sicily. The first appearance of the Carthaginians in the island dates from B.C. 536; but the steady growth of the Greek cities in wealth and power long confined their rivals to the n.w. part, where their principal colonies were Panormus, Motya, and Soloeis. The first open trial of strength took place in the great battle of Himera, where the Carthaginian army was utterly routed by Gelon, and its leader Hamilcar slain. The Gelonian dynasty at Syracuse fell B.C. 466, after various fortunes. During the next 50 years, the island had peace. B.C. 410, however, the war between the Carthaginians and Greeks for possession of the island was renewed. The successes of the former were great and permanent. Selinus, Himera, Agrigentum, Gela, and Camarina fell into their hands in less than five years; and it was not till Syracuse had got a new 'tyrant,' the famous Dionysius (q.v.) the Elder, that fortune again began to favor the Greeks. Even he, however, could not wrest from the Carthaginians what they had won; and after the war of B.C. 383 peace was concluded, leaving Dionysius in possession of the e., and the Carthaginians of the w., half of the island. The dissensions and tumults that followed the death of Dionysius illustrate forcibly the peculiar dangers to which the Greek republics, either at home or abroad, were prone; but we can only note the triumph of the popular party under Timoleon B.C. 343, and the splendid victory of the latter over the Carthaginian generals, Hasdrubal and Hamilcar, at the river Crimisus, B.C. 340. Once more Greek influence was in the ascendant, but the rule of the bold and ambitious tyrant Agathocles, B.C. 317–289, proved in the main disastrous to Greek supremacy. After his death, Syracuse lost her hold over many of the Greek cities, which established a weak and perilous independence, that only rendered the preponderance of the Carthaginians more certain. Finally Pyrrhus (q.v.), King of Epirus, was invited over to help his countrymen, and B.C. 278 he landed in the island. The brilliant adventurer —one of the most romantic figures in classic history—for a time swept everything before him. Panormus, Ercte, and Eryx were captured; and though he failed to make himself master of Lilybæum, he might probably have forced the Carthaginians to surrender it, had he not been thwarted in his designs by the miserable discords and jealousies of the people whom he came to save. As it was, Pyrrhus left Sicily in about two years; and the island would probably have sunk into a Carthaginian possession, had not a new power appeared on the stage—the Roman. For the struggle for supremacy between Rome and Carthage, the most tremendous struggle in ancient history, see ROME, and the names of the leading generals. In B.C. 246 Carthaginian S., and B.C. 210 the whole island, became a Roman 'province'—the first Rome ever held. Henceforth it shared the fortunes of the great state to which it was annexed, and its special history need only be rapidly glanced at. In B.C. 135–132, and again B.C. 103–100, it was the scene of two formidable slave-insurrections, during which it was frightfully devastated. Its fertility, and the wealth of its citizens and land-holders, were also powerful temptations to greedy and unscrupulous governors, of whom a specimen is Verres, pretor B.C. 73–70, 'damned to everlasting fame' in the Orations of Cicero. Augustus visited S. after the close of the civil wars, and established some colonies; but it does not seem to have prospered under the empire; and A.D. 440 it was conquered by the Vandals under Genseric. The Vandals, in their turn, were compelled to cede it (480) to Theodoric, King of the Ostrogoths, in whose hands it remained till 535, when Belisarius conquered and annexed it to the Byzantine empire. In this condition it remained till 827, when the Saracens invaded the island, and after a protracted struggle, lasting 114 years, expelled the Byzantine Greeks, and made themselves masters of Sicily. They kept possession of it more than a century, but after a contest of 30 years were driven out by Robert Guiscard (q.v.) and Roger de Hauteville, at the head of a body of Normans, aided by the 'native' inhabitants, whom we conjecture to have been much the same as in the old classic times—for the successive waves of barbaric and Saracenic invasion that swept over the island appear to have left little trace of their action. Even to this day, it is highly probable that the people of S. are largely the descendants of the early Siculi. The Normans held rule in the island 1072–1194; and the Norman 'Kingdom of Sicily and Naples' or 'Kingdom of the Two Sicilies,' dates from 1130, when Roger II., obtaining possession of most of the continental dominions of his uncle, Robert Guiscard, assumed the title of king. During the rule of the Swabian dynasty (see HOHENSTAUFEN, HOUSE OF), 1194–1258, the political history of S. is the same as that of Naples; but 1282, after the dreadful massacre of the French, known as the Sicilian Vespers (q.v.), it again became independent, chose for its king Pedro III. of Aragon, who was the sole representative by marriage of the House of Hohenstaufen, and remained in the possession of the Aragonese sovereigns till 1505, when the union of the crowns of Castile and Aragon—in other words, the rise of the Spanish monarchy in the persons of Ferdinand and Isabella—placed it under the dominion of Spain. The fortune of war also gave Ferdinand the possession of Naples; and the Spanish kings retained both countries until the war of the Spanish succession, 1700–13 (see Succession Wars). By the treaty of Utrecht (1713), S. was separated from Naples; and transferred to Victor Amadeus, Duke of Savoy, who, however, restored it to the crown of Naples by the treaty of Paris, seven years later, receiving in exchange the island of Sardinia. From 1720 the two countries continued under the same dynasty, the House of Austria, 1720–34; and the Spanish Bourbons 1734–1860 (if we except the brief rule of the French in Naples, 1806–15, when Joseph Bonaparte, and afterward Joachim Murat, were kings), till the period of Garibaldi's invasion (see Italy: Garibaldi), which resulted in the annexation of both to the new kingdom of Italy under Victor Emmanuel.

SICK, a. *sĭk* [AS. *seóc;* Ger. *siech;* Icel. *siukr;* Goth. *siuks*, sick: probably connected with Sigh, which see: comp. Low Ger. *sucht*, a sigh, sickness: Dut. *suchten*, to sigh, languish: Gael. *sgìth*, weary]: affected with disease of any kind; indisposed; not in health; inclined to vomit; weary of: V. in *OE.*, to sicken. Sick'ish, a. *-ĭsh*, inclined to be sick; exciting disgust. Sick'ishly, ad. *-lĭ*. Sick'ishness, n. *-nĕs*, the quality of being sickish. Sick'ly, a. *-lĭ*, not healthy; ailing; feeble. Sick'liness, n. *-lĭ-nĕs*, state of being habitually diseased or in bad health. Sick'ness, n. *-nĕs*, state of being in bad health; illness. Sick-bay, n. a portion of the main-deck of a vessel, usually in the bow, partitioned off for invalids. Sick-bed, the bed to which one ailing is confined. Sick-berth, in a *ship of war*, an apartment for the sick. Sick headache, headache attended with disorder of the stomach and nausea. Sick-list, names of persons ailing. Sick-room, the apartment where one lies ill. The sick, those affected with disease. Sicken, v. *sĭk'n*, to make sick or squeamish; to fall into disease; to languish; to decay. Sick'ening, imp. *-nĭng:* Adj. disgusting; making sick. Sick'ened, pp. *-nd.*—Syn. of 'sick, a.': ill; disordered; diseased; morbid; ailing; feeble; distempered; indisposed; weak; disgusted.

SICKER, or Siker, a. *sĭk'ėr* [Dan. *sikker;* Ger. *sicher*, sure, safe—from L. *secūrus*, safe]: in *Scot.* and *OE.*, certain; sure; firm; having assurance of mind: V. to make certain; to secure: also spelled Siccar. Sick'erness, n. in *OE.*, security.

SICKINGEN, *sĭk'ĭng-ėn*, Franz von: soldier: 1481, Mar. 1—1523, May 7; b. in the ancestral castle of Ebernburg near Kreuznach, in Baden. He was one of the richest and most powerful barons in the empire, and stood high in the favor of Emperors Maximilian I. and Charles V. He carried on wars with the Duke of Lorraine, the city of Metz, the Landgrave of Hesse, etc. He was the friend and protector of reformers and humanists. At the instance of Ulrich von Hutten, S. collected an army of soldiers of fortune, 1522, for the purpose of overthrowing the princes temporal and spiritual, and bringing all Germany into direct subjection to the emperor, attacking first the abp. of Treves. But a few of the menaced barons made a coalition against him; and, driven out of one stronghold after another, S. was at last mortally wounded in the bombardment of his castle of Landstuhl near Kaiserslautern.



Sickles.

SICKLE, n. *sĭk'kl* [AS. *sicol;* Ger. *sichel,* a scythe for mowing hay—from L. *secŭla,* a sickle—from *secārĕ,* to cut]: an instrument for cutting down grass or grain; a reaping-hook. Sickled, a. *sĭk'kld,* furnished with a sickle.

SICKLES, *sĭk'lz,* Daniel Edgar: soldier: b. New York, 1823, Oct. 20. He studied at the Univ. of New York, learned the trade of printer, then studied law and commenced practice 1844 in New York. He was elected to the state legislature as a democrat 1847, went to London as sec. of legation 1853, became state senator 1855, and entered congress 1857, Dec. For criminal intimacy with Mrs. Sickles he killed Philip Barton Key 1859, Feb. 27, and was acquitted of murder after a trial which continued 20 days. He served in congress till 1861, when he raised the Excelsior brigade of Union troops. He was appointed col. and was afterward promoted brig.gen. and maj.gen.; served at Fair Oaks, Malvern Hill, Antietam, Fredericksburg, and Chancellorsville, and lost a leg at Gettysburg; was in command of the dist. of the Carolinas 1865–67; was minister to Spain 1869–73, and since the latter date has resided in New York. He has been connected with various state boards; was appointed commissioner of emigration 1887, May; and sheriff of the city and county of New York, to fill the unexpired term of James A. Flack, 1890, Mar. 28. In milit. service he was brevetted brig.gen. and maj.gen., and was retired 1869, Apr. 14, with rank of maj.gen. U. S. army.

SICKLY, SICKNESS: see under Sick.

SICULIANA, *sē-kôl-yâ'nâ:* city of Sicily, province of Girgenti, 8 m. w.n.w. of the city of Girgenti. It stands on the sea, and has a small, poor harbor. Pop. 6,000.

SICYON, *sĭs'ĭ-on:* principal city of a very small but exceedingly fertile state of ancient Greece, Sicyonia, in the n. of the Peloponnesus, having the Corinthian Gulf for its n. boundary, with Achaia on the w., Phlius on the s., and Corinth on the e. The territory was level toward the sea, somewhat mountainous in the interior, and well watered by the two rivers Asopus and Helisson, between which, on a triangular plateau, was situated S., about two m. s. of the Corinthian Gulf, ten m. n.w. of Corinth. Round the three sides of the plateau ran a wall, which, combined with the precipitous nature of the heights that surrounded it, rendered the position of S. one of great strength. It is supposed that at one time it had, like Athens, a double wall reaching from the city to the port on the Sea of Corinth. S. was anciently celebrated as a chief seat of painting and statuary (tradition asserting that the former was invented there), it having given its name to a school of painting which included among its disciples Pamphilus and Apelles, both natives of Sicyon. It was the native city also of Aratus (q.v.), general of the Achæan League. There exist at the present day a few remains of the ancient city, as well as of the more modern buildings erected by the Roman conquerors of Greece, near which stands a small modern village named *Vasilika.*

SIDA, *sī'dâ:* genus of plants of nat. order *Malvaceæ*, containing a large number of species, annual and perennial herbaceous plants and shrubs, natives mostly of warm climates, and widely diffused. They generally abound in mucilage, and some are used in medicine in India, as the Mallow and Marsh-mallow are in Europe. They have also strong pliable fibres, used for cordage and for textile purposes.—*S. tiliæfolia,* an annual, has long been cultivated in China, where it is called *King-Ma,* for its fibre, used like that of hemp. Its cultivation has been introduced into Italy and France.—In N. America, several species of S. are small-flowered weeds, from N. Y. southward. *S. Napæa,* with axillary corymbs of white flowers, the corolla 1 in. broad, wild in Penn. and Va., was cultivated in gardens.

SIDDONS, *sĭd'onz,* SARAH (KEMBLE): English actress: 1755, July 5—1831, June 8; b. Brecon, S. Wales; eldest of 12 children of Roger Kemble, a provincial actor. As a mere child, she was brought on the stage on the occasion of a benefit of her father's; and from that time up to her 15th year she continued to act as a regular member of his company: her mother, however, made special effort to give her a good education. An attachment having sprung up between her and young William Siddons, an actor of the company, he was dismissed from the company, and she was sent to be a lady's maid in Warwickshire. But, at last having gained the reluctant consent of her parents, she was married to him at Trinity Church, Coventry, 1773, Nov. 26, and with her husband went to act at the Cheltenham theatre. Here in the year following she drew great attention; and Garrick, hearing her praises in London, sent a trusty emissary to report upon her. The result was an engagement at a salary of £5 a week, at the London Drury Lane Theatre, where 1775, Dec. 29, she made her first appearance, acting Portia in *The Merchant of Venice* to the Shylock of Garrick. Her beauty and dignity of person pleased the audience; but as an actress she made no great impression, and at the close of the season she failed to secure a re-engagement. This was considered due partly to her inexperience, and partly to her having vexed Garrick by an unintentional error in stage-business, which made him act with his back to the public in one of his pet passages, a mortification which the great man was little enough to remember and resent.

Leaving London thus in disappointment, 1776, Mrs. S. went to play in the provinces—at Birmingham, Manchester, and York; and found a very successful engagement at Bath (1778–82); at the end of which she was recalled to

Drury Lane, and in London entered on a career of triumph as indisputably the greatest actress of her time. The growth of her provincial reputation had determined her recall to the metropolis, where her appearance in Southern's *Isabella* was an epoch equalled only by Garrick's in 1741 and Edmund Kean's in 1814. Until she took her leave of the public 1812, June 29, in her great character of Lady Macbeth, her course was one long series of successes. Subsequently she occasionally consented to reappear on the stage for charitable ends, or to promote a stage 'benefit.' She died in London.

As a tragic actress, Mrs. S. has probably never in Britain been equalled. For comedy she had no gift. Her earlier acting was strongest in tenderness and pathos; in later years she developed an unequalled grandeur in depicting the terrible passions. As Lady Macbeth, she invested the character with tragic awe: this part and that of Queen Catherine in *Henry VIII.* exactly fitted her extraordinary powers. As a woman, she was of unblemished reputation and was held in respect by all who knew her. She had the friendship of many persons of eminence. Her genius is said to have been strictly a *stage* genius; elsewhere she seems to have displayed no extraordinary gifts. But her manner could make even mediocrities imposing. She carried her tragedy mode with her to the drawing-room or the dinner-table: Scott has recorded the amusement with which at Abbotsford he heard her stately blank verse to the domestic:

> 'I asked for water, boy! you've brought me beer;'

and Sydney Smith used to say it was never without a certain awe that he saw her '*stab the potatoes.*'

SIDE, n. *sīd* [Icel. *sida;* Dan. *side;* Dut. *zijde;* Ger. *seite*, a side]: the long or broad part of anything as distinguished from the end; the part of an animal from the shoulder to the buttock, as a *side* of bacon; one part of a thing as seen by the eye; any part generally; the margin; edge; border; quarter; region; party; sect; branch of a family; any part or position viewed as opposite to, or as contrasted with, another; used to denote consanguinity, as, by the mother's *side:* ADJ. toward the side; lateral; oblique; indirect: V. to embrace the opinions of one party in opposition to another; in *OE.*, to be at the side of. SI'DING, imp.: N. the attaching one's self to a party; in *railways*, a short line of rails turning off from the main line. SI'DED, pp.: ADJ. having a side, as one-*sided.* SI'DER, n. *-dėr*, one on a particular side, as out-*sider.* SIDE'LING, ad. *-līng,* with the side foremost; sloping. SIDE-ARMS, weapons worn at or by the side, as a sword or bayonet. SIDEBOARD, a piece of furniture placed at the side of a room. SIDE-CUT, an indirect blow or attack. SIDE-DISH, a dish at the side of a table, as opposed to the top and the bottom. SIDE-GLANCE, a glance or brief look to one side. SIDELONG, a. oblique; not directly in front: AD. obliquely; in the direction of the side. SIDE-PLATES, the parts at the back of a plow which prevent the earth falling into the body of the plow. Side-pocket, a pocket at the side. Side-posts, among *carpenters*, a kind of truss-posts, placed in pairs, for supporting the principal rafters, braces, etc. Side-saddle, a saddle for a lady. Sidesman, n. *sīdz'măn*, an officer in a church; an assistant to the churchwarden. Side-table, a table placed against a wall, or apart from the chief table. Side-taking, engagement with a sect or party. Side-view, a view on or from one side. Side-walk, the raised footway of a street. Side'ways, ad. *-wāz*, toward the side; on one side. Side-wind, a wind blowing against the side; indirect means. Side'wise, ad. *-wīz*, toward one side; inclining. By the side of, close at hand; near to. To choose sides, to select for competition in exercises of any kind. To take sides, to embrace the opinions of a party in opposition to those of another, or to attach one's self to their interests. Side by side, close together and abreast.—Syn. of 'side, n.': margin; edge; verge; party; interest; cause; favor; faction; sect; border; slope; declivity.

SIDE'-BONES: enlargements above a horse's heels, resulting from the conversion into bone of the elastic lateral cartilages. They occur mostly in heavy draught-horses with upright pasterns, causing much stiffness, but—unless of rapid growth—little lameness. They are treated at first by cold applied continually, until heat and tenderness are removed, when blistering or firing is resorted to.

SIDERATION, n. *sĭd-ėr-ā'shŭn* [L. *sidus*, a star; *sīdĕris*, of a star]: in *med.*, a name given to erysipelas of the face or scalp, from the idea of its being produced under the influence of the planets.

SIDEREAL, a. *sī-dē'rĕ-ăl* [L. *sīdĕrālis*, of or belonging to the stars—from *sidus*, a star]: relating to or containing stars; starry; measured by the apparent motions of the stars. Sideral, a. *sī'dėr-ăl*, in *OE.*, starry; astral. Sidereal clock, clock regulated to indicate sidereal time—indispensable in an observatory. Sidereal day, period in which the earth performs one complete revolution round its axis (see Day). Sidereal year, time which the sun, in its apparent motion, takes to move from any fixed star till it returns to it again, being the real time in which the earth performs one complete revolution, computed at 365 days 6 hours 9 min. 9·6 seconds: see Year.

SIDERITE, n. *sĭd'ėr-īt* [Gr. *sidērŏs*, iron or steel]: a name given to sparry iron ore; cube-ore; sometimes applied to a spathose iron ore; carbonate of iron; chalybite.

SIDERO-, prefix [Gr. *sidērŏs*, iron]: of, belonging to, or resembling iron in lustre, hardness, or weight, etc.

SIDEROGRAPHY, n. *sĭd'ėr-ŏg'ră-fĭ* [Gr. *sidērŏs*, iron; *graphō*, I write]: art of engraving on steel; in particular, a process of engraving and transfer, in which a design is first engraved on a steel block, which is afterward hardened, and the engraving transferred to a steel roller under heavy pressure; the roller is then hardened and used as a die to impress the engraving on the printing-plate. The inventor of S. was Jacob Perkins (q.v.). The name S. is applied also to Dyer's process for printing from steel plates in more than one color. The colored parts of the design are cut out of the main plates, and movable pieces are exactly fitted in, so that they can be retracted or pushed forward at will. They are withdrawn while the main plate is receiving its ink, and they are pushed forward beyond while receiving their supply of ink. This being done, they are brought to one plane, and form a complete plate for printing from.

SIDEROLITES, n. plu. *sĭd'ėr-ō-līts* [Gr. *sidērŏs*, iron; *lithos*, a stone]: meteoric stones, chiefly consisting of iron.

SIDEROMANCY, n. *sĭd'ėr-ō-măn'sĭ* [Gr. *sidērŏs*, iron; *mantei'a*, divination]: divination by burning straw, etc., upon red-hot iron.

SIDEROSCOPE, n. *sĭd'ėr ō-skōp* [Gr. *sidērŏs*, iron; *skopĕō*, I view or explore]: an instr. for detecting small quantities of iron in substances.

SIDEROXYLON, *sĭd-ē-rŏks'ĭ-lŏn:* genus of trees of nat. order *Sapotaceæ*, having evergreen leaves and axillary clusters of flowers; natives of warm climates, and very widely distributed. They are remarkable for the hardness of their wood, which is sometimes called Iron-wood, and is at least in some species so heavy as to sink in water. The wood of *S. inerme*, called *Melkhout* at the Cape of Good Hope, is there much used for making boats, bridges, agricultural implements, etc.

SIDI-BEL-ABBÈS, *sē'dē-bĕl-âb-bās':* town of Algeria, province of Oran, 50 m. s. of the town of Oran. It is fortified, and contains barracks, telegraph and post offices. Markets are held here every week. The soil in the vicinity is fertile; grain, tobacco, and fruit are the chief products. Pop. of commune, 6,458.

SID'LAW HILLS: see FORFARSHIRE: BIRNAM.

SIDLE, v. *sī'dl* [from SIDE]: to go or move side-foremost. SI'DLING, imp. *-dlĭng*. SI'DLED, pp. *-dld.* TO SIDLE UP TO ONE, to creep up to one cautiously and little by little.

SIDMOUTH, *sĭd'mŭth:* market-town and watering-place on the s. coast of Devonshire, at the mouth of the little river Sid. S. was a borough and market-town governed by a portreeve, as early as the 13th c. It was anciently important as a fishing town and seaport; but the fishery has declined, and the harbor is mostly filled up with sand and shingle, so that it is accessible to small boats only. The town has for many years been a watering place, favorite for mildness and salubrity of climate. The hills on each side of the valley of the Sid rise to a considerable height, and, where they terminate on the sea coast, form bold and lofty cliffs, e. and w. of the town, known respectively as Salcombe Hill and High Peak, about 500 ft. above the sea The esplanade protected by a sea-wall, 1,700 ft. in length, forms an excellent promenade. Some Roman remains have been found here. S. gives the title of viscount to the Addington family.—Pop. (1881) 3,501 ; (1891) 3,758.

SIDNEY: city and county-seat of Shelby co., O., on Miami river, and at crossing of Dayton and Michigan, and Cleveland Columbus Cincinnati and Indianapolis r. rs. Water-power from the river runs flouring-mills, machine shops, manufactories of carriages, ploughs, reapers, etc. S. has court-house, opera house, churches, schools, newspapers, etc.—Pop. (1890) 4,850; (1900) 5,688.

SIDNEY, *sĭd'nĭ*, Sir PHILIP: conspicuous soldier, statesman, and poet at the court of Queen Elizabeth: 1554, Nov. 29—1586, Oct. 7; b. Penshurst, Kent; son of Sir Henry S. and Mary, sister to Robert Dudley the favorite of Queen Elizabeth. When ten years old he was sent to school at Shrewsbury, whence, 1569, he went to Christ-Church, Oxford. From Oxford, he passed to Cambridge, which he left with a high reputation for scholarship and general ability. In 1572, as the custom then was for young men of rank, he went abroad on his travels. He was in Paris when the Massacre of St. Bartholomew took place, and narrowly escaped being one of its victims. Thereafter, he visited Belgium, Germany, Hungary and Italy; and 1575 he returned home, perfected in all manly accomplishments. His uncle, Dudley, Earl of Leicester, was at this time in the zenith of his fortunes, and for S. a court-career lay temptingly open. As a courtier, his success was great; and with Queen Elizabeth he became, and continued through his short life, a special favorite. In 1576, as a mark of her approval, he was sent on an embassy to the court of Vienna, from which he returned in the year following. Shortly afterward he had the boldness to address to the queen a 'Remonstrance' against her proposed marriage with Henry, Duke of Anjou, a union to which she seemed not indisposed. It is significant of the high favor in which he was held by her, that Elizabeth, imperious as she was in temper, and little inclined to brook such interference, seems to have in this instance resented it but for a brief period. About this time, a quarrel with the Earl of Oxford led to S.'s temporary retirement from court, during which, at Wilton, the seat of his brother-in-law, the Earl of Pembroke, he wrote his celebrated *Arcadia*. In 1583 he consoled himself for the marriage of Lady Penelope Devereux, to whom he had been ardently attached, and who figures as the Stella of his poems, by himself marrying Frances, daughter of Sir Francis Walsingham. By this lady, he had one daughter, who survived him. In the spring of 1585, he is said to have meditated sailing with Sir Francis Drake in an expedition against the Spaniards in the W. Indies, but to have been expressly forbidden by Elizabeth, on a ground of anxiety 'lest she should lose the jewel of her dominions.' It does not seem consistent with this pretty story, that later in the same year she appointed him gov. of Flushing, whither he went to take part in the war between her allies, the Hollanders, and the Spanish. As it proved, she thus sent him to his death. At the battle of Zutphen (1586, Sep. 22), in Gelderland, after behaving with conspicuous gallantry, and having a horse killed under him, he received a musket shot in the thigh, from which he had removed his armor; and after lingering for some days in great suffering, he died at Arnheim in his 33d year. A chivalrous impulse occasioned his death; he had cast off his greaves that he might put his life in 'the same peril with the lord-marshal, who by some mischance was on the field without greaves.' His characteristic passing of the cup of water to a dying soldier when he himself was lying in agony and thirst on the field, may well have occurred as related, though it is scarcely to be regarded as historical. The estimation in which S. was held by his countrymen was shown in the passion of grief with which the news of his death was received. His body was brought to England, and after lying in state, was buried with great solemnity in the old cathedral of St. Paul's, a general mourning being observed throughout the country. The universities issued three volumes of elegies on his death; and Spenser in his *Astrophel,* mourned for the loss of one who as a friend had been dear to him.

The love and admiration which S. won from his contemporaries was mainly a tribute to the singular beauty of his character. His short life was illustrated by no brilliant achievement; and his literary genius, though true and exquisite in its kind, would scarcely of itself have sufficed to account for the fervor of regard he inspired. But his purity, firmness, and grace, and the winning courtesies in which his radiant nature expressed itself, took captive all hearts while he lived, and have since kept sweet his memory. 'Sublimely mild, a spirit without spot,' he lives in the history of his country, as a rare and finished type of English character, in which the antique honor of chivalry is seen shading into the graces of the modern gentleman. His *Arcadia* (pub. 1590) though overrun with the fantastic affectations of the time, is flushed with the lights of a fine imagination, and shows indisputable genius, and reflects its author's sincerity and sweetness. His series of 110 sonnets, *Astrophel and Stella,* was the first body of English sonnets worthy of note. His other chief work was the *Apology for Poesie,* pub. 1595. See Fulke Greville's Biography of S.; Zouch's Memoirs of S. (1808); and H. R. Fox Bourne's *Memoirs of Sir Philip Sidney* (1862); and his best sonnets, selected, in Mrs. Ward's *English Sonnets.*

SID'NEY (or SYD'NEY) ALGERNON: soldier, diplomatist, author, and agitator: 1622–1683, Dec. 7; b. Penshurst, Kent, England; grand-nephew of the famous Sir Philip S., and second son of the second Earl of Leicester, and grandson of the Earl of Northumberland. He received a careful education, and accompanied his father to Denmark and France, whither the earl had been sent on embassies. In 1641 he served with distinction against the rebels in Ireland, of which country his father was then lord-lieut. In 1643, with his elder brother, Viscount Lisle, he crossed to England, ostensibly to take service under the king, then at war with his parliament; but at Liverpool they were detained by the parliamentary commissioners; and from this time S. was an earnest adherent of the parliamentary cause. At the battle of Long Marston Moor, in which he was wounded, S.'s courage and capacity were conspicuous. In 1646 he was lieut.gen. of the horse in Ireland, and gov. of Dublin; and 1647 received the thanks of the house of commons for his services, and was appointed gov. of Dover. The year before he had been returned to parliament as member for Cardiff. In 1648 he was one of the judges at the king's trial; and though, for some reason not explained, he neither was present at the passing of sentence, nor signed the warrant of execution, his general approval of the proceedings is not doubted. He is reported to have afterward spoken of the execution as 'the justest and bravest action that ever was done in England or anywhere else.' In principle a severe republican (he was of austere disposition), he resented what he deemed the usurpation of power by Cromwell (q.v.), and during the protectorate lived in retirement at the family seat of Penshurst. In 1659, on the meeting of the restored parliament, S. was again in his place. He was nominated one of the council of state, and was sent to Denmark on a political mission. After the Restoration he lived precariously on the continent, flitting about from place to place; but 1677 a pardon was procured him from Charles II., and he returned to his native country. Nevertheless, he was still obdurately republican in his opinions, and it is undoubted that he schemed for the overthrow of the monarchy, and the establishment of a republic in its stead; for this end he solicited the aid of the French monarch, though the charge that he was supplied with money by Barillon, French ambassador, rests on insufficient evidence. Obscurely his designs were suspected, and 1683, June, when the Rye House Plot was announced, the opportunity was seized for riddance of a man felt to be dangerous. With his friend Lord Russell and others, he was arrested, and committed to the Tower; Nov. 21 he was tried for high treason before the brutal Jeffreys, and without show of justice, and in defiance of law, and on the merest mockery of evidence, was found guilty and condemned to die. He was beheaded on Tower Hill. He met his death with heroic firmness, amid general sympathy and indignation. He has ever since had reputation as a patriot hero and martyr; and it cannot be held undeserved—narrow and impracticable as his views manifestly were. In the history and theory of government, S. was more deeply learned than any man of his time. His *Discourses concerning Government* were published 1698; another edition was issued 1704; a third 1751; a fourth 1772. S.'s life has been written by S. W. Meadley (Lond. 1813). See also Blencower's *Sidney Papers* (Lond. 1813).

SID'NEY SUS'SEX COLLEGE: one of the colleges of Cambridge Univ., England; founded 1598 by Lady Frances Sidney, Countess of Essex, or rather by her executors, in obedience to her will. They obtained of Queen Elizabeth a mortmain for the purpose, and purchased of Trinity College the site of the ancient convent of Franciscans, or Gray Friars. There are 10 fellowships.

SIDON, *sī′don* [Heb. Zidon, perhaps 'fishing-place']: anciently, a city of Phœnicia, on the e. coast of the Mediterranean, lat. 33° 34′ 5″ n., 45 m. s. of Berytus, about 125 m. n. of Jerusalem. It was on a rising mound, protected by the sea on the n. and w.; while the bed of a river formed a natural fosse to the s., and the high hills shielded it on the e.; a double harbor gave shelter to its ships. It soon rose, both by its exceptional position and by the daring and enterprise of its inhabitants, to the highest rank among the cities of Phœnicia (q.v), so that the whole country is sometimes designated by the name of S., 'the Great,' 'the Metropolis.' The extensive commerce of S. is well known from ancient authorities. Its colonies extended over the coast of Asia Minor and the adjacent islands, the coast of Thrace and Eubœa, and even parts of Sicily, Sardinia, Spain, the coast of Cornwall in England, and the Baltic shores, northern parts of Africa, and, in fact, nearly the whole of the ancient world. Its manufactures of glass and linen, purple dye and perfumes, were sources of unbounded wealth; and whether they were the skilful workers, or merely the exporters and traders of those works in gold and silver, ivory and bronze, which were the marvel of both Greeks and Hebrews, it seems certain, that they were considered unanimously the most skilful workmen of their time. Although S. was one of the cities assigned to the Israelites by Joshua, it never in reality belonged to them; but was occasionally in arms against them, either singly, or in league with some of their deadliest enemies, and even subjugated them for a time. After being conquered itself by Tyre, its daughter-city, it attempted to throw off the yoke at the invasion of Phœnicia by Shalmanezer, to which king it surrendered. Under Assyrian, Chaldean, and Persian domination, it retained a kind of independence for its internal affairs, and under the Persians, actually reached its highest prosperity. But an unsuccessful revolt under Ochus against the Persian power, ended in its temporary ruin B.C. 351. Speedily rebuilt and repeopled, it opened its gates to Alexander the Great B.C. 333; and from that time forth it fell successively into the hands of Syrian, Greek, and Roman rulers. Through the middle ages, little is heard of it, except that it was taken by the Crusaders. During part of the 17th and 18th c. it again became a place of commerce; but misrule and violence put an end to its rising prosperity, and the number of its inhabitants has sunk to about 5,000. There is still some little export of silk, cotton, and nut-galls. It is now called Saida, occupies a place somewhat w. of the ancient city, and belongs to the Turkish pashalic of Acre. See PHŒNICIA.

SIDONIAN, a. *sī-dō′nĭ-an:* of or belonging to Sidon (q.v.).

SIEBENBÜRGEN, *sē′bĕn-bürch-ĕn* (Seven Castles): German name of the Austrian principality of Transylvania (q.v.).

SIEBENGEBIRGE, *sē'bĕn-gĕh-bĭrch'ĕh:* group of conical heights in Rhenish Prussia, on the right bank of the Rhine, about 22 m. above Cologne. The highest of the peaks is the Löwenkopf or Löwenberg, 1,560 ft.; but the most famous is the Drachenfels (q.v.).

SIEGE, n. *sēj* [F. *siége;* It. *sedia*, a seat or sitting—from *sedērĕ*, to sit: comp. the use of L. *obsidĭum*, a sitting down before a town in a hostile way, a siege—from the same root]: act or operation of taking position around or before a fortress or fortified town, to capture it, or to compel its surrender (see below): any continued endeavor to gain possession; the base or bottom of a glass furnace on which the pots containing the fused glass stand; in *OE.*, a seat or throne; a class; a rank; a place: V. in *OE.*, for BESIEGE. **SIEGE-ARTILLERY**, heavy ordnance used for battering purposes, and of too weighty a character to take the field. A siege-train of guns and their ponderous ammunition is usually maintained in the rear of an army, ready to be brought up for use when required. **SIEGE-TRAIN**, the cannon, mortars, etc., for carrying on a siege. To **RAISE A SIEGE**, to abandon the attempt to take a fortified place by force.

SIEGE: investment by an army of a hostile town or fortress with the intention of capturing it. See FORTIFICATION. With certain elements the success of a S. is beyond doubt; the result being merely a question of time. These elements are: first, the force of the besiegers must be sufficient to overcome the besieged in actual combat, man to man. If this be not the case, the besieged, by a sortie, might destroy the opposing works, and drive away the besiegers. Secondly, the place must be thoroughly invested; so that no provisions, reinforcements, or other aliment of war can enter. Thirdly, the besiegers must in large degree be undisturbed from without: for this it is essential that there shall not be a hostile army in the neighborhood; or if there be, that the operations of the besiegers be protected by a covering army able to cope with the enemy's force in the field. The ancients executed gigantic works to produce these effects. To complete the investment they built a high and strong wall around the whole fortress; and to render themselves secure from without they built a similar wall facing outward, beyond their own position: the first was circumvallation, the second contravallation. It was thus that Cæsar fortified himself while besieging Alexia, and maintained 60,000 men within his ring. In modern warfare it is considered preferable to establish strong posts here and there round the place, and merely sentries and vedettes between.

Let us now assume that a fortress of great strength has to be reduced, and that the force of the enemy in the vicinity has been either subdued or held in check by a covering army. By rapid movements, the place is at once invested on all sides. This step constitutes merely a blockade; and if time be of little importance, is a sufficient operation, for hunger must sooner or later cause the fortress to surrender; but if more energetic measures are required, the active siege must be prosecuted. Advantage is taken of any hidden ground to establish the park of artillery and the engineers' park; otherwise these parks have to be placed out of range. The besieging force is now encamped just beyond the reach of the guns of the fortress, and their object is to pass the intervening ground and enter the works without being torn to pieces by the concentrated fire of the numerous pieces which the defenders can bring to bear on every part. With this view, the place is approached by a series of zigzag trenches so pointed that they cannot be enfiladed by any guns in the fortress. In order to accommodate the forces necessary to protect the workers, the trenches at certain intervals are cut laterally for a great length, partly encircling the place, and affording safe room for a large force with ample battering materiel. These are called *parallels*, and are generally three in number. The distance of the first parallel will increase as small-arms become more deadly; but with the old smooth-bore muskets it was usual to break ground at 600 yards from the covered way of the fortress, while at Sebastopol, ground was broken at 2,000 yards, and in the siege of Paris by the Germans, the lines were begun at least 4 miles from the city. The locality of the parallel being decided on, a strong body of men is sent to the spot soon after nightfall. The attention of the garrison is distracted by false alarms in other directions. Half the men are armed cap-à pie, and lie down before the proposed parallel; while the other half, each bearing pick and shovel, and two empty gabions, prepare for work. Each man deposits the gabions where the parapet of the trench should be. He then digs down behind them, filling the gabions with the earth dug out; and, after they are filled, throwing it over them, to widen and heighten the parapet. Before daylight, the working-party is expected to have formed sufficient cover to conceal themselves and the troops protecting them. During the day, they—being concealed from the garrison—widen and complete their parallel, making it of dimensions sufficient to allow of wagons and bodies of troops with guns passing along. During the same night, other parties will have been at work at zigzags of approach from the depots out of range to the first parallel, which zigzags will be probably not less than 1,000 yards in length. The profile of a completed trench is shown in fig. 1, the shaded portion representing a gabion. As a rule, the defenders will not expend ammunition on the first parallel, for its extent (often several miles) will render the probability of doing material damage extremely small. For this reason also, the dimensions of the parapet and its solidity are of far less importance in the first parallel than in the more advanced works of attack. The first parallel, AAA, fig. 2, being completed, the engineers select points near its extremities,

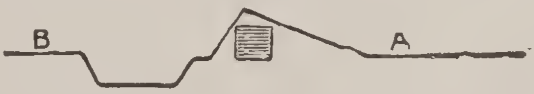


Fig. 1.—Profile of a Trench.

at which they erect breastworks, B, B, to cover bodies of cavalry, who are kept at hand to resist sorties from the garrison. The length of the parallel is usually made sufficient to embrace all the works of two bastions at least. Sites are then chosen for batteries, C, C, which are built up of fascines, gabions, sandbags, and earth. They are placed at points in the parallel formed by prolongation of the several faces of the bastions, ravelins, and other works of the fortress, which faces the batteries are severally intended to enfilade by a ricochet fire. Other batteries will be formed for a vertical fire of mortars and shell-guns. By these means it is hoped that the traverses on the hostile ramparts will be destroyed, the guns dismounted, and the defenders dispersed, before the final approaches bring the assailants to the covered-way. The sappers will now commence their advance toward the points, or salient angles, of the two bastions to be attacked. If, however, the trench were cut straight toward the fortress, its guns could easily destroy the workmen, and enfilade the approach. To prevent this, it is cut in short zigzags—as at D—the direction always being to a point a few yards beyond the outmost flanking works of the garrison. The site of each trench nearest the fortress is protected by gabions and sandbags, as in the case of the parallel. At intervals, short spurs of trench, incipient parallels, are cut, as at E, to contain small-arms-men, to act as guards to the sappers. The second parallel is about 300 yards (though this varies with circumstances) from the enemy's works, and has to be more strongly formed than the first. It often terminates in a redoubt, F, to hold some light artillery, and a strong force of infantry, who could assail any sortie in flank; or it may run into the first parallel, as G, giving easier access for troops than through the zigzags. The second parallel is riveted with sandbags, in which loopholes are left for musketry. After passing the second par-

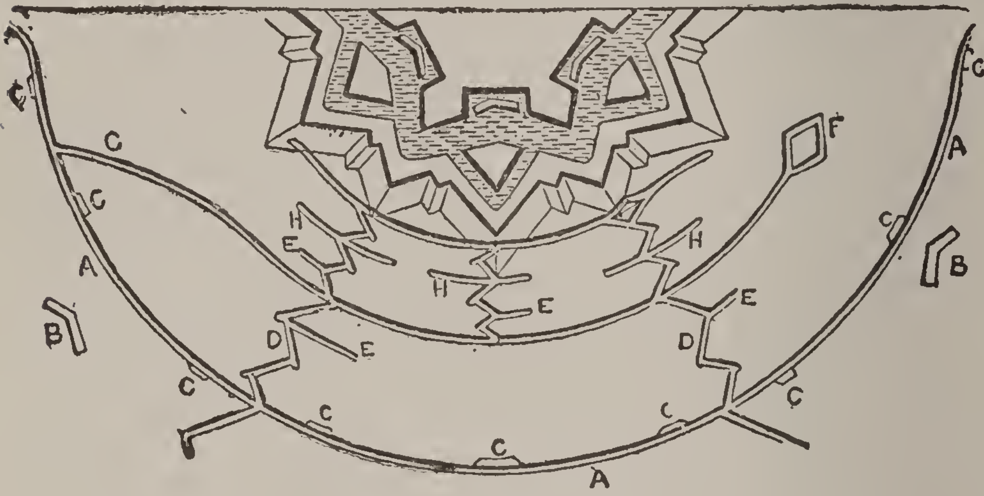


Fig. 2.—Siege Works.

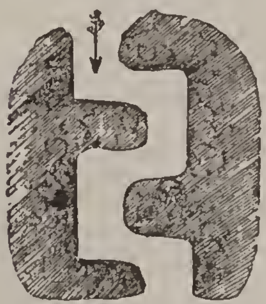


Fig. 3.—Double Sap.

allel, the angles of the zigzags become more acute, to prevent enfilading. At about 150 yards certain demi-parallels, H, are cut, and armed with howitzer batteries, to clear the covered-way, while riflemen also act from it. The third parallel is at the foot of the glacis. Thence the place, after being sufficiently battered, is taken by a storming-party, who make their way over the glacis, or the covered-way is topped by the double sap, as in fig. 3; which is a safer plan for the army generally, though much more deadly to the sappers. When the crest of the covered-way has thus been reached, batteries of heavy artillery will be there established, for the purpose of breaching the walls of the ravelin and bastion; while miners will seek first to destroy the defenders' counter-mines (which would otherwise be likely to send these batteries into the air), and then will excavate a tunnel to the ditch, at the foot of the counterscarp. If the breach becomes practicable, a storming-party will emerge from this tunnel or gallery, and seek to carry the opposite work by hard fighting. If inner works still subsist, which would tear assailants to pieces, the double sap may be continued across the ditch, if a dry ditch, right up the breach, that counter-batteries may be formed. If the ditch be wet, means must be adopted for a causeway or a bridge. By these means, however obstinate may be the defense, if the besieging force be sufficiently strong, and aid do not arrive from without, the ultimate success of the attack becomes certain. Vauban raised attack to a superiority above defense, first, by introduction of ricochet fire which sweeps a whole line; and secondly, by originating parallels. Before his time, the whole attack was conducted by zigzag approaches; in which the troops actually in front could be but few, and were therefore unable to withstand strong sorties of the garrison, who, in consequence, frequently broke out and destroyed the works of the besiegers, rendering a siege an uncertain operation.

In N. America a notable S. was that of Louisburg (q.v.), 1745. The S. of Boston by Gen. Washington with more than 20,000 troops began immediately after the battle of Bunker Hill, 1775, June 17, when a system of fortifications was extended gradually from the Mystic river around to Roxbury. The artillery was reinforced by 50 pieces brought on sleds from Ft. George by Gen. Knox. Washington waited for ice to afford the means of crossing the Back Bay; failing to realize this hope, he conceived (and carried out during a night bombardment, 1776, Mar. 17) the excellent strategy of seizing and fortifying Dorchester Heights, which commanded the harbor. By Mar. 10 he had fortified Nooks Hill, immediately overlooking the British works on the 'Neck.' Mar. 17 Gen. Howe with more than 9,000 soldiers evacuated, and on the 20th Washington entered the city. Two years later, 1778, Aug., the S. of Newport by Gen. Sullivan and the French was abandoned after it was well begun, in consequence of the arrival of a British fleet and reinforcements. The S. of Savannah, begun 1780, Sep. 16, by Gen. Lincoln with 3,600 men and Count D'Estaing with 6,000 French, ended in an unsuccessful assault Oct. 9, after which the French, having offered aid for a limited time, withdrew for duty at the French W. India Islands, leaving Count Pulaski among the slain. In the S. of Charleston, S. C., the patriots were the besieged, 3,900 men under Gen. Lincoln surrendering 1780, May 12, after one month's investment by Gen. Clinton with 8,500. The decisive and successful S. of Yorktown by the allied forces, 16,400, under Gen. Washington, against Cornwallis with 8,500, extended from the environment, 1781, Sep. 29, to the surrender, Oct. 18 (see Yorktown, Siege of).—In the civil war, a noted S. was that of Vicksburg, which place Gen. Sherman pronounced more difficult to capture than Sevastopol. Assaults proved unavailing, and after 1863, May 22, it was a regular S. till July 4, when Gen. Pemberton surrendered 32,000 men with all stores to Gen. Grant (see Vicksburg, Siege of). The S. of Petersburg, Va., preceding the downfall of the Confederacy, was siege-like in its proceedings from the last of June, 1864, till 1865, Mar. 25, but there was no complete investment of city or enemy (see Petersburg, Siege of). See Donelson, Fort.

SIEGEN, *sē'ghĕn:* manufacturing town of Prussia, in Westphalia, on the Sieg, 38 m. s.s.w. of Arnsberg. Its inhabitants are engaged in manufacturing leather, cotton, and woolen goods. S. is said to produce also the best iron in w. Germany. In the vicinity are numerous iron mines and smelting furnaces. Its iron and steel wares are noted, especially its files. Pop. (1890) 12,312.

SIEGERT, *sē'ghĕrt,* Karl August: painter: 1820, May 5—1883, Oct. 17; b. Neuwied, Prussia. At the age of 17 he began the study of painting at Düsseldorf, under Hildebrandt, with whom he remained four years, and then continued his studies at the acad. in that city till 1846. He spent some years in foreign travel, and 1851 was appointed prof. of painting at the Düsseldorf Acad. Some of his *genre* pictures brought him great and deserved fame. Among his principal works were the *Dinner Hour, Sunday Morning,* and *A Lay Brother Distributing Alms.*

SIEG'FRIED: see Nibelungenlied.

SIEMENS, *sē'mĕnz,* Ernst Werner: German physicist and inventor: 1816, Dec. 13—1892, Dec. 6: b. Lenthe. While artillery-officer, he patented a process for electroplating 1841; later made improvements in the electromagnetic telegraph, and established at Berlin the firm of Siemens & Halske for building the same. He was the first to fire submarine mines by electricity 1848, and invented methods of locating injuries to submarine cables, and lessening disturbance from induced currents; also gutta-percha appliances, relays, the 'Siemens' armatures for electric locomotives, the pneumatic postal tube, a registering alcoholometer, etc. In pure science he published a new theory of volcanic phenomena, founded on experiments relating to change of volume in glass and other silicates. In 1886 he read before the Acad. a memoir on the conservation of energy as illustrated in terrestrial and meteorological phenomena; also, before the German congress of naturalists, an essay on synthesis of aliments from elements by help of electricity. He offered to the state $119,000 toward founding an institution of technical physics. He was elected a mem. of the Acad. of Science of Berlin 1874, and received the honorary degree of doctor from the Univ. of Heidelberg 1886.

SIE'MENS, Karl Wilhelm; known as Sir William S.: civil engineer and inventor: 1823, Apr. 4—1883, Nov. 19: b. Lenthe; bro. of Ernst Werner S. He studied at Göttingen and the Magdeburg Polytechnic School, worked in the machine-shops of Count Stolberg, and settled in London 1843, becoming later the London partner of his brother Ernst Werner, in concert with whom and his brother Friedrich he made many inventions and investigations, credit for which is due to the three together. But to him chiefly is due the regenerating gas-furnace, dating from experiments in 1846. The Siemens steel-works were built in Landore, Wales, 1869, with capacity of 1,000 tons of cast-steel every week, produced in part from the ore directly by the Siemens method. Among the inventions due to him alone or in collaboration are the marine bathometer, the hydraulic gun-brake to counteract recoil, an electrical pyrometer, a chronometric regulator (adopted in the royal observatory), a process for reproducing print, a double cylinder air-pump, a water-meter, etc.; besides the electric locomotive, etc., of the three brothers. He published, among other memoirs, one on the conservation of heat in mechanical work, another on resistance to electrical absorption under pressure; also on conservation of solar energy. His collected works, *Gesammelte Abhandlungen und Vortrage*, were pub. 1885. He was knighted by Queen Victoria; and his funeral occurred at Westminster Abbey.—Friedrich S., bro. of the preceding, b. Menzendorf, near Lubeck, 1826, Dec. 8, besides participating in the inventions of his brothers, applied the regenerating gas-furnace to the manufacture of glass, succeeded his brother Jean as director of the Dresden glass-works, and controlled four works in Bohemia, employing 4,000 workmen. He has written on heating by radiation, distribution of light and heat, temper of glass, dissociation, and combustion.

SIE'MENS' FURNACE: see Glass.

SIENA, *sē-ā'nâ.* city of central Italy, 60 m. s. of Florence. It is on three little hills, separated by valleys, and higher than the hills surrounding. Its climate is on this account very salubrious, notwithstanding the deficiency of water caused by its elevated position; to remedy which, subterranean aqueducts were long ago excavated, five m. in length, some dating as far back as the Roman dominion. Its environs are not beautiful, consisting of naked clay-hills, capped with sandstone; but the city is surrounded by trees and avenues, which have a fine effect. The handsome square, Piazza del Campo, is one of the finest in Italy: 11 streets lead out of it, and it is surrounded by handsome buildings. In this square is also the famous tower called the *Mangia*, of prodigious height; there are also other towers here and there, seen from a great distance—remnants of the habitations of the feudal lords. The streets are narrow, some paved with tessellated bricks, others flagged. There are many ancient Gothic palaces, not remarkably handsome. In the Piazza del Campo stands the Palazzo Pubblico, built in the 13th c., in which are magnificent rooms, and paintings by eminent artists. S. has a fine cathedral, erected, it is said, on the foundations of the Temple of Minerva; it was begun 1059, the façade dating from the 13th c. It is faced with black and white marble, and covered with ornaments and sculptures. The pavement is of marble tessellated, representing many biblical subjects. In the different chapels and in the baptistery are frescoes, paintings, and statues, by distinguished masters. The other churches also are rich in works of art. Of the many oratorios, the most noteworthy is that of St. Catharine (q.v.), occupying the house of the saint. S. is an archiepiscopal see.—The Sienese are singularly industrious, and have numerous manufactories. The univ., founded 1330, has fame as a school of medicine. The Italian spoken at S. is reckoned among the purest.—Pop. (1892) 28,500; (1901) 28,355.

S. was founded as a Roman colony in the time of Julius Cæsar, under the name Sena, or Sena Julia. There are no remains of antiquity; and it does not appear to have been a place of importance until the middle ages, when it became one of the powerful city republics of Italy. It adhered to the Ghibellines, and in conjunction with the forces of Pisa defeated the Tuscan Guelfs in the memorable battle of Monte Aperto (1260). At the height of its greatness, it is said to have had a pop. of 200,000.—S. produced a 'school' of artists, of whom the most distinguished names are Guido da Siena, Simone Memmi, Sodoma, Beccafumi, and Baldassare Peruzzi.

SIENITE: see SYENITE.

SIENKIEWICZ, *sēn'kē-wĕks*, HENRYK; 1845— ——; b. Lithuania: Polish novelist. He was educated at the Univ. of Warsaw, and 1876 attempted to found in California an ideal community of immigrant Poles. The scheme failed; he returned home, and turned to the writing of psychological novels and historical romances, among which are *With Fire and Sword* (1890); *The Deluge* (1892); and the vigorous and remarkable *Quo Vadis, a Narrative of the Time of Nero* (1896).

SIENNA, *sĭ-ĕn'na:* pigment made of *terra di Sienna* (Sienna earth), a compound of iron oxide and earthy matter. Sienna is of two kinds, raw and burnt, the latter being simply the earth exposed to red heat, so as to make it take up more oxygen: see BURNT SIENNA: TERRA.

SIERRA, n. *sĭ-ĕr'ră* [Sp. *sierra*, a saw, a ridge of mountains—from L. *serra*, a saw]: ridge or range of mountains with notched saw-like outline. *Note.—Sierra* is also said to be derived from Ar. *sehrah*, an uncultivated tract.

SIERRA LEONE, *sĭ-ĕ'ralē-ō'nē* (Mountain of the Lion): Brit. colonial settlement on the S. L. coast, w. Africa. The settlement consist chiefly of a peniusnla, just s. of the S. L. river, on which the cap., Freetown, stands: the coast from Scarciaz river to the border of Liberia (180 m.) and the Isles de Los Sherboro and others; area stated at 4,000 sq. m. In 1896 a protectorate was established over a section of the Hinterland for a distance of 180 m. inland; area 30,000 sq. m.; pop. 1,000,000. Along the coast stretches a belt of rich low-lying land, and elsewhere in the colony are fertile tracts; but the inter. is a mass of rugged mount., with generally barren soil. The climate is humid and unhealthful—the wet season, May to Nov., being specially pestilential. Tropical fruits and plants grow luxuriantly in the favorable regions; and coffee, sugar, indigo, and cotton have been introd. by the Brit. In 1901 exports amounted to £304,010 ($1,477,488), chief articles being gold, cotton goods, ground-nuts, palm-oil, hides, palm-nuts, manufactured tobacco, and timber: import £548.286 ($2,664,669), the chief articles were cotton goods (nearly one-half of the whole value), gunpowder, ready-made apparel, hardware, haberdashery and rum. In 1882-3 the total value of exports was $2,007,799; imports $2,086,266. The chief exports are benni-seed, cola-nuts, ginger, ground-nuts, hides, palm-kernals, palm-oil, rubber and gum copal. The colony is ruled by a gov. appoin. by the crown and assisted by a council. In 1866 S. L., the Gambia, the Gold Coast, and Lagos were placed under one gen. govt., the 'Government of the West African Settlements'; but in 1874 the Gold Coast and Logas were separated, and in 1888 Gambia. Trade with the U. S.: exports (1889) $73,921; imports (1880-90) $1,931,155; exports (1880-90) $1,770,667.—Since 1804 the Eng. Church Missionary Soc. has spent $2,500,000 in religious and educational work in the colony. In 1889 fortifications and barracks were completed on the coast, and the cable was extended to the Cape of Good Hope station; and 1890 a joint French and English expedition was fitted out for the purpose of delimiting the frontier.

The settlement of S. L. was established 1787, when 470 destitute negroes were removed to it from London by a body of philanthropists; and 1,196 negroes were sent to it from Nova Scotia—the climate of which had proved too severe for them—1790. The pop. was increased by other bands of people of color; and since the abolition of the slave-trade 1807, the slaves captured by British cruisers have been put ashore and settled here. In 1880 there were in S. L. 18,660 Episcopalians, 17,098 Wesleyans and Methodists, 2,717 of Lady Huntingdon's Connection, and 369 Rom. Catholics. Fourah Bay College, near Freetown, Wesleyan High School, Annie Walsh Memorial Female Institution, and the grammar school opened 1846 were the chief educational institutions.—Pop. (1820) 12,000; (1881) 60,546—only 250 whites; (1890) 75,000; (1901) 76,655.

SIER'RA MADRE, *mâ'thrā:* central portions of the great chain of Cordilleras or Rocky Mts., in Mexico, from lat. 19° to 25° n.; and in New Mexico, to the great w. range, from lat. 34° to 38° n. These ranges, not yet fully explored, contain some of the richest silver mines in the world.

SIER'RA MORENA, *mō rā'nâ:* mountain range in Spain, on the s. border of New Castile, between the modern provinces of Ciudad Real and Jaen. It separates the upper portions of the basins of the Guadiana on the n. and of the Guadalquivir on the s., and rises in its highest point to 5,500 ft. above sea-level. It is frequently mentioned in *Don Quixote*, and is the scene of many of its incidents.

SIER'RA NEVADA, *nē-vâ'dâ* (*Snowy Range*): range of mountains in California, forming a portion of its e. boundary; the source of a multitude of rivers, which swell the Sacramento and San Joaquin. The range extends from n.w. to s.e. 450 m., and is united to the Coast Range, which runs parallel with the Pacific, by Mt. San Bernardino. See CALIFORNIA. Among the higher peaks of the S. N. are Mt. Whitney (highest mountain in U. S. apart from Alaska), 14,887 ft. high; Mt. Shasta, 14,442; Mt. Tyndall, 14,386. There are immense deposits of gold quartz, with steam and water power crushing-mills; also some copper.

SIER'RA NEVADA, *nā-vâ'thâ* (*Snowy Range*): mountain range of Spain, in Andalusia, extending e. from Padul, 12 m. s. of Granada, to the frontiers of the modern province of Almeria; 60 m. in length, 20 to 30 m. in breadth; more than 1,000 sq. m. It is continued on the n.e. by the Sierra de la Filabras, and forms a portion of the watershed between the streams that flow into the Mediterranean and those that flow into the Atlantic. The peak of Mulhacen reaches a height of 11,678 ft., the highest summit not only of the Spanish Peninsula, but of the whole of Europe w. of the Alps. The peak of Veleta is 11,387 ft. high. The range receives its name from the perpetual snow which covers the highest summits. The views from the summits, from which, on the s., may be seen the faint outline of the African coast, on the n., the jagged sierras of the Castiles, are scarcely surpassed in beauty and magnificence by any in Europe.

SIESTA, n. *sĭ-ĕs'tă* [Sp. *siesta;* L. *sexta* (*hora*), the sixth hour—that is, noon]: the midday or after-dinner nap.

SIEUR, n. *syér* [F. *sieur*, lord of the manor—contracted from *seigneur* (see SEIGNIOR)]: sir; a title of respect used by the French.

SIEVE, n. *sĭv* [AS. *sife;* Low Ger. *seve;* Dut. *zeef;* Ger. *sieb*, a sieve: Icel. *sef;* Dan. *siv*, sedge or rush—the *sieve* having been originally made of rushes]: a utensil, generally in shape like the head of a drum, covered with hair or a material with open meshes, for separating flour from bran, or the smaller particles of anything from the large; a bolter; a basket used as a measure.

SIEYÈS, *sē-yĕs'*, EMMANUEL JOSEPH, Comte: prominent figure, as the Abbé S., in the history of the French Revolution: 1748, May 3—1836, June 20; b. Fréjus. He was educated at the Univ. of Paris with a view to his entering the priesthood, and obtained the appointment at Treguier, in Bretagne (1775), whence 1780 he was transferred to the cathedral of Chartres, of which diocese he became chancellor and vicar-gen. He had early imbibed extreme liberal opinions on all matters social and political, which were preparing the French Revolution; and when, 1789, the states-general were summoned, he issued his famous pamphlet, *Qu'est-ce que le Tiers État?* This work, which claimed for the people political recognition, naturally obtained immense popularity for its author, and procured his election as one of the deputies for Paris. Mainly through his urgency and influence it was that, 1789, June 16, the representatives of the people took the decisive step of constituting themselves into an independent body, and became the national assembly. Of this body he continued for some time to be one of the most prominent figures. In 1791 he was elected to the legislative assembly, then convened, as member for the dept. of Paris. By this time, however, he had sunk from his first pre-eminence; bolder and fiercer spirits had passed him in the race for power and popularity, and where he had once led, he now reluctantly followed. In the convention of 1792, to which he was elected as deputy of the dept. of La Sarthe, he prudently refrained from active participation in the debates, and at the king's trial he recorded a silent vote. While Robespierre and his party were in power, he consulted his safety by retiring from Paris. When afterward asked what he had done during the Reign of Terror, he quietly replied: *J'ai vécu* ('I have lived'). On the fall of Robespierre, he returned to his post in the convention, and became a member of the new committee of public safety. He was engaged chiefly in the department of foreign policy, and went as ambassador to Holland and Berlin successively to negotiate treaties of alliance. He became a member of the directory 1799, and, among other reactionary measures, he succeeded in closing the celebrated Jacobin Club. Perceiving that a stable government was on no other terms possible, he became anxious to secure the co-operation of some powerful military leader, particularly as he was ambitious above all things of giving France a 'constitution' (of which he had drawn up one or several); and on the return of Bonaparte from Egypt, he entered into a league with him, whose result was the revolution of 18th Brumaire (1799, Nov. 9), and the institution of the consulate—S., Napoleon, and Roger Ducos being the three first consuls. Speedily, however, S. discovered in his new ally his master. As to the distribution of power in the new constitution to be formed, he and Napoleon differed irreconcilably; the man of bayonets was the stronger; S.'s political nostrums never got beyond the paper on which they were written; and finally, in disgust at his subordinate position, S. threw up his place in the govt. As a reward of his services, he received on his retirement 600,000 francs and the estate of Crosne, afterward exchanged for a splendid hotel in Paris and the lands of Fainanderie, in the park of Versailles. Also the title Count was conferred on him. Subsequently the presidency of the senate was offered him, but he declined it, and never afterward concerned himself in public affairs. Banished at the Restoration, he did not return to France till after the revolution of 1830; and died in Paris. Mignet's *Histoire de la Révolution* contains a description of S.'s proposed constitution; and under the title *Théorie Constitutionelle* of S., and *Constitution de l'An VIII.*, M. Boulay (de la Meurthe) pub. (Par. 1836) from S.'s own *Mémoires inédits* a more detailed account.

SIFT, v. *sĭft* [see SIEVE]: to separate by shaking a sieve; to pass through a sieve; to examine minutely or critically. SIFT'ING, imp.: N. act of one who sifts or uses a sieve. SIFT'ED, pp. SIFT'ER, n. *-ĕr*, he or that which sifts. SIFT'INGS, n. plu. the dust and smaller particles separated from a commodity, as tea-siftings.

SIGAULTIAN, a. *sĭ-gōl'shĭ-ăn* [from *Sigault*, a French surgeon who first performed the operation]: applied to the surgical operation of enlarging the capacity of the pelvis in cases of impracticable labor.

SIGEL, *sē'ghĕl*, FRANZ: soldier: born Sinsheim, Baden, 1824, Nov. 18. He graduated from the Carlsruhe milit. school 1843, entered the army, and had reached the rank of lieut. 1847, when he killed a man in a duel, and resigned his commission with the intention of studying law at Heidelberg, but 1848 joined an unsuccessful rebellion against the govt., and had to flee from the country. He returned to engage in another insurrection 1849, was appointed minister of war, and became chief commander of the revolutionary forces. When the provisional govt. was overthrown, he took refuge in Switzerland, but was expelled from that country 1851. After living in England about a year, he came to New York, and engaged in teaching and in literary work. He removed to St. Louis 1858 to teach in the German Institute, became a member of the board of education, and was connected with a military journal. At the opening of the civil war, he organized troops for the Union army, was commissioned col., rendered efficient service in Mo. and Ark., was in command of forces in Va. 1862, in Penn. 1863, and of the dept. of W. Va. 1864. He was appointed brig.gen. 1861, May 17; maj.gen. 1862, Mar. 21; and resigned from the army 1865, May 4. He was register of New York 1871–74, pension agt. in that city 1886-89. He died 1902, Aug. 21.

SIGH, n. *sī* [AS. *sican;* Sw. *sucka;* Dan. *sukke;* W. *igio*, to sigh or sob: Ger. *seufzen;* Low Ger. *suchten*, to sigh: Scot. *souch*, the sound of the wind, or of one breathing heavily: imitative words]: a deep, long-drawn, and audible respiration, as in grief or pain: V. to express by sighs; to inhale and respire a long breath audibly, as in grief or pain; to grieve. SIGH'ING, imp.: N. the act of taking a long and audible breath; expression of grief. *Sighing* is nothing more than a very long-drawn inspiration, in which a larger quantity of air than usual is made to enter the lungs. This is continually taking place to a moderate degree, and Dr. Carpenter remarks that it occurs particularly when the attention is released after having been fixed on an object which has strongly excited it and thus has prevented the person from feeling the insufficiency of the ordinary movements of respiration. Hence this action is often a simple result of deficient aëration; while in other cases it is excited by a depressed state of the feelings. SIGHED, pp. *sīd.* SIGH'INGLY, ad. *-lĭ.*

SIGHT, n. *sīt* [AS. *gesiht;* Dan. *sigte;* Sw. *sigt*, sight: Ger. *sehen*, to view]: act or faculty of seeing; perception of objects by the eye (see SIGHT, DEFECTS OF): view; a being within the limits of vision; that which is beheld; a spectacle; a show; knowledge from seeing; a small aperture through which a thing is seen, as the eye-piece of a quadrant; a small piece of metal fixed on the muzzle of a gun to guide the eye in taking aim (see GUNNERY): in *OE.*, a large number; a multitude: V. to look at through a sight; to see accurately; to gain the proper elevation and direction to by means of a sight; in *nautical language*, to come in sight of. SIGHT'ING, imp. SIGHT'ED, a. seeing in a particular way, as near-*sighted.* SIGHT'LESS, a. *-lĕs*, wanting sight; blind; in *OE.*, offensive to the eye; unpleasant to look at; invisible. SIGHT'LESSLY, ad. *-lĭ.* SIGHT'LESSNESS, n. *-nĕs*, the state of being sightless; want of sight. SIGHT'LY, a. *-lĭ*, pleasing to the eye; comely. SIGHT'LINESS, n. *-lĭ-nĕs*, the state of being sightly; comeliness. TO COME IN SIGHT, to obtain a view of, as land. AT SIGHT, when presented, and AFTER SIGHT, when the time mentioned has expired, said of commercial bills and notes of exchange. SIGHT-SEEING, a. given to seeing sights: N. the act of seeing sights; eagerness for seeing novelties or curiosities. SIGHT-SEER, one given to seeing sights.—SYN. of 'sight, n.': view; vision; show; spectacle; exhibition; representation; notice; knowledge; eye.

SIGHT, DEFECTS OF: impairments of the optical apparatus: only such impairments are considered here as are due to some known or unknown peculiarity of the optical apparatus (including the optic nerve) not dependent on disease—viz., *short-sight, long-sight, double vision, color-blindness*, and *night-blindness.*—See EYE, DISEASES OF THE.

Short-sight, near-sight, or *myopia* [from Gr. words *myō*, I close; *ōps*, the eye], is often popularly confounded with dim or weak sight; but, in reality, short-sight applies exclusively to the *range* and not to the *power* of sight, and a short-sighted person may possess the acutest power of vision for near objects. In this affection, the rays which ought to come to a focus upon the retina converge to a point more or less in front of it. The cause of this defect probably differs in different persons. It may arise from overconvexity of the cornea or the lens, from undue density or abundance of the humors of the eye, or from an imperfect power of the eye to adjust itself to objects at various distances, or from an elongation of the posterior part of the eye: this last is by far the most frequent cause of myopia. The distance at which objects are perceived most distinctly by the perfectly normal eye ranges from 16 to 20 inches; an eye which cannot perceive objects distinctly beyond 10 inches may fairly be regarded as short-sighted; and in extreme cases the point of distinct vision may be three, two, or even only one inch from the eye. Short-sight is strongly hereditary: it seldom appears before the age of 7, after 25 years it seldom advances; but sometimes it does advance till at the age of 50 or earlier the power of vision is utterly lost, whether through separation of the choroid, from effusion of the blood, or from atrophy and degeneration of the yellow spot. As a general rule, the inhabitants of towns are much more liable to it than persons living in the country, and students and literary men are the most liable of all. While in the foot-guards (Brit. army), consisting of nearly 10,000 men, not half-a dozen men have been discharged, nor have a dozen recruits been rejected, on account of this imperfection during 20 years, in one college at Oxford, of 127 students, 32 were short-sighted (or *myopes*) (Donders, *On the Accommodation and Refraction of the Eye*, London, 1864, p. 342). The frequency of this affection in the cultivated ranks points directly to its principal cause—tension of the eyes for near objects. An investigation made by the statistical bureau of Munich (1891) shows that, of every thousand boys in the 1st or elementary class of the Munich schools, 36 are short-sighted; in the 2d class, 49; in the 3d, 70; in the 4th, 94; in the 5th, 108; in the 6th, 104; in the 7th and last, 108. In the case of girls, the increase is from 37 to 119. The myopia depending, as Donders believes, on prolongation of the visual axis, this eminent physiologist inquires: 'How is this prolongation to be explained? Three factors may here come under observation: 1. Pressure of the muscles on the eyeball in strong convergence of the visual axes; 2. Increased pressure of the fluids resulting from accumulation of blood in the eyes in the stooping position; 3. Congestive processes in the base of the eye, which, leading to softening, give rise to extension of the membranes. That in increased pressure the extension occurs principally at the posterior pole is explained by the want of support from the muscles of the eye at that part. Now, in connection with the causes mentioned, the injurious effect of fine work is, by imperfect illumination, still more increased; for thus it is rendered necessary that the work be brought closer to the eyes, and that the stooping position of the head, particularly in reading and writing, be also increased. Hence it is that in schools where, by bad light, the pupils read bad print in the evening, or write with pale ink, the foundation of myopia is mainly laid. On the contrary, in watchmakers, although they sit the whole day with a magnifying-glass in one eye, we observe no development of myopia, undoubtedly because they fix their work only with one eye, and therefore converge but little, and because they usually avoid a very stooping position.'—*Op. cit.*, 343, 344.

In the treatment of myopia, the principal objects are: 1. To prevent its further development and the occurrence of secondary disturbances; and 2. By means of suitable glasses to render the use of the myopic eye easier and safer.

1. To effect, if possible, the first object, the patient must look much at a distance; but as we cannot absolutely forbid his looking at near objects, spectacles must be provided which render vision distinct at from 16 to 18 inches. Moreover, it is desirable that at intervals of a half-hour work should be discontinued for a couple of minutes; and no working in a stooping position should be permitted. The patient should read with the book in the hand, and in writing should use a high and sloping desk.

2. The optical remedy for short-sight obviously consists in concave glasses of a focus suited to the individual case. At first sight, it might be supposed that glasses with a concavity exactly sufficient to neutralize the defect in the eye would always suffice; and when the glasses are used exclusively for distant vision (for example, in the double eye-glass, which is only at intervals held before the eye), or when the affection is slight, and the eye is otherwise healthy, perfect neutralization is admissible; but in a given case so many circumstances may forbid the complete neutralization of the myopia, that an oculist of reputation should always, if possible, be consulted as to the choice of spectacles. Glasses injudiciously selected usually aggravate the evil that they are intended to remedy.

Long-sight, hypermetropia, or *presbyopia*, is produced by parallel rays that enter the eye meeting in a point behind the retina: it is a condition usually attending advanced years (hence the name, from *presbus*, old person, and *ops*). It is in most cases due to shortening of the axis of the eye; but sometimes to absence of the lens. In this state, the nearest point of distinct binocular vision is about 8 inches (or double the ordinary distance) from the eye. This condition, which is as natural a concomitant of advanced life as gray hairs or wrinkles, is occasionally met in young persons: in these cases, it generally arises from intestinal irritation, and may be a precursor of amaurosis; hence such cases should be carefully watched. In ordinary presbyopia, the defect is at once remedied by the use of glasses of low convex power, as of 30 or 24 inches focus, which should, however, be worn only during reading and writing, and not constantly. Although the improper use of convex glasses is not nearly so dangerous as the inconsiderate use of concave glasses, the advice of a good oculist regarding the choice of spectacles is well worth his fee.

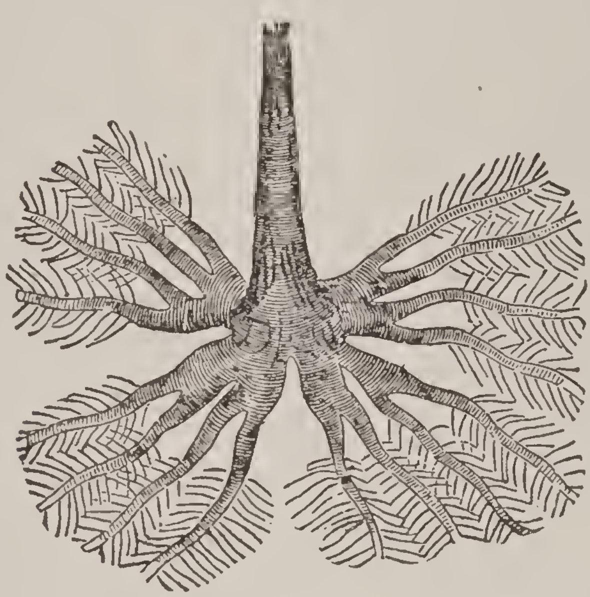
Double vision, or *diplopia*, is of two kinds. It may arise from lack of harmony in the movements of the two eyes, the vision of each eye singly being perfect; or there may be double vision with one eye only. The first form may occur (1) in cases of squinting, or (2) in cases of paralysis of one or more of the muscles of the orbit. In cases of Squinting (q.v.), the vision of the most distorted eye is almost always imperfect; and it is well known that impressions on the two retinæ are similar in kind but dissimilar in form. The mind takes cognizance only of the former; so that a person with a bad squint sees objects with the sound eye only. But if the sight of both eyes is nearly equal, as often is the case when the squint is not very well marked, double vision results whenever both eyes are employed together, in consequence of images of nearly equal intensity falling on non-corresponding parts of the two retinæ. This variety of double vision, although annoying, is perfectly harmless. When double vision arises from muscular paralysis, disease of the brain of a serious nature is to be apprehended, though the affection sometimes appears to arise from exposure to cold. The second form of double vision—viz., double vision with a single eye—is a much more rare affection than the preceding one, and depends upon some irregular refraction of the cornea or lens.

For *color-blindness,* see that title.

Night-blindness, or *hemeralopia* (Gr., signifying 'day-sight'), is a peculiar form of intermittent blindness, the subjects of which see perfectly with an ordinary light, but become entirely and almost instantaneously blind as soon as twilight commences. It is rare except in tropical regions. The most probable cause is exhaustion of the power of the retina from over-excitement by excessive light, so that this organ is rendered incapable of appreciating the weaker stimulating action of twilight or moonlight: other causes are scurvy, and (it is said) even sleeping in moonlight. All that suggests itself in the way of treatment is to protect the eyes from strong light during the day, and to prescribe quinine and a nourishing mixed diet.

Snow-blindness must be regarded as an allied affection to the preceding. See VISION.

SIGILLARIA, n. *sĭj'ĭl-lā'rĭ-ă* [L. *sĭgil'la,* little figures or images—from *signum,* a mark, an image: It. *sigillo,* a seal]: genus of fossil plants, important because of their singular structure and their remarkable abundance in the coal-measures. They seem to have contributed more than any other genus of woody plants to the formation of coal. The roots of S. are found preserved in the shale which forms the floor of all coal-seams. These roots were originally supposed to be distinct plants, and have received the generic name Stigmaria: the notion formerly accepted regarding them was that they were fleshy water-plants, with numerous linear leaves, articulated to the stem by papillæ, which were buried in deep cylindrical hollows in the stem. Brongniart first suspected that they were roots, and Dr. Charles Thomas Jackson of Boston, and Binney, placed the question beyond doubt by discovering a specimen in which the trunk of a S. rose from the crown of a Stigmaria. Several observers have subsequently seen these fossils also in actual contact; and the general opinion is that the Stigmarias were under-ground stems. The stems of S. are abundant in the coal-beds. They are marked by parallel longitudinal flutings and regular scars formed by the bases of the leaf-stalks, which had fallen off. They are known to have attained a height of 70 ft. and a diameter of 5 ft. The stem rose without branching till near the summit, when it branched several times dichotomously. The proportion of woody matter to cellular tissue in the stem was very small. The woody fibre is characterized by abundance of scalariform vessels, similar to those in *Lepidodendron* and in the recent vascular Cryptogamia. The stem is seldom found preserved so as to exhibit any structure, or even its cylindrical form; it generally occurs as a double layer of coal, showing on the outer surfaces the scars produced by the bases of the leaf-stalks. The form and arrangement of these scars have been used to distinguish the species. Its affinities are probably near to *Lepidodendron,* and some of the numerous fragments which have been referred to this genus may really be the branches of Sigillaria. It has been restored as a huge *Lycopodium,* and some of those fruits which, under the names of *Lepidostrobus* and *Flemingites,* have been described by Brown, Hooker, and Carruthers, doubtless belong to it.—The term S. is aplied also to small images or ornaments made in a mold.



Trunk of Sigillaria rising from the Stigmaria Roots
(*E. W. Binney*).

SIGISMUND, *sĭj'ĭs-mŭnd,* Emperor of Germany: (reigned 1411–37) d. 1437; son of Emperor Karl IV. He was well educated; and having married Maria of Anjou, on her accession to the throne of Hungary he became chief administrator of that kingdom. The death of his wife 1392 made him king of Hungary; and at the head of an army of more than 100,000 Hungarians, French, Germans, and Poles, he attempted to relieve the Byzantine empire from the fierce Turks, but was terribly defeated at Nicopolis, 1396, Sep. 28. On his return to Hungary, he found on the throne a new monarch, Ladislas of Naples, who imprisoned him (1401); but through the good offices of his elder brother, Wenceslas, he was freed, and obtained the throne (1402), rewarding his elder brother by snatching from him his kingdom of Bohemia. In 1410 he was elected emperor, on the death of Rupert, but was not fully recognized till 1411. The important events of his reign were ecclesiastical. He was present at the Council of Constance, which he had prevailed upon Pope John XXIII. to hold for the purpose of putting an end to the Hussite and other schisms. He contented himself with protesting against the violation of the imperial safe-conduct which had been given to Huss; and ultimately consented to his judicial murder, for the purpose, as his apologists say, of conciliating the council, and so settling the disputes concerning the papacy. This atrocious act enraged the Bohemians, and his succession to the throne of Bohemia after his brother's death was opposed by the Hussites, who were now in insurrection; and after a fruitless attempt to conquer them, he confined himself to the defense of Hungary against the Turks, whom he defeated in a great battle near Nissa (1419). For ten years afterward he left Germany much to the guidance of its self-willed petty rulers, who speedily brought the country into such a deplorable state that they were glad to beseech S. to return to the helm of affairs—which he did, but with little good effect. He obtained, by concessions to the Calixtines (q.v.), the crown of Bohemia 1436; but on coming to the throne, he gradually withdrew these concessions; which provoked such discontent that only his death averted a civil war. S. had intelligence and political talents, but these were neutralized by his impetuosity, indecision, selfishness, and extraordinary avarice; and his well-meaning endeavors after peace and improvement ended in nothing. Carlyle distinguishes S. by the epithet *Supra Grammaticam*, in allusion to his answer to a cardinal at the Council of Constance, who ventured to correct his majesty's grammar—'I am the Roman king, and above grammar.'

SIG'ISMUND, THE GREAT, King of Poland: 1467–1548, Apr. 1 (reigned 1506–48); b. Koziénicé; youngest son of Casimir IV. He was chosen Grand Duke of Lithuania 1506, and succeeded to the kingdom of Poland Dec. 8. The affairs of Poland and Lithuania were in a sad condition; the s. portions of the country reduced almost to a desert by the ravages of the Tartars, while the e. was continually in dread of the Russians, who had become an independent, united, and powerful monarchy. The Russians invaded Lithuania, and conquered some provinces; but S gained a brilliant victory over them at Orsza, on the Dnieper, 1508, July 14. Bogdan, Prince of Moldavia and Walachia, now invaded the s. provinces, as that semi-barbarous race had been accustomed to do without hindrance;

but he was so decisively routed on the banks of the Dniester that he agreed to acknowledge himself a vassal of Poland. Disregarding the suggestions of the pope to head a crusade against the Turks, S. 1512 taught the Tartars, through his gen., Ostrogski, a forcible lesson against aggressive practices which cost them 27,000 men, and assured the tranquillity of his frontier for a long period. His alliance 1513 with Stephen Zapoli, voyvode of Transylvania, whose daughter Barbara he married, alarmed Emperor Maximilian, who incited the Russians to resume their aggressions, which that ill-advised nation cheerfully agreed to do, paying dearly for their rashness, for their army of 80,000, which had invaded Lithuania, was met and cut to pieces 1514, Sep. 8, by Ostrogski with 32,000 men, at Orsza, leaving its standards, cannons, and other arms, 2 generals, 37 princes, 6,000 prisoners, and 30,000 dead in the possession of the enemy. Subsequent invasions of Moscovites and Tartars were repelled as before, and a rebellion of the Walachs was punished by numerous defeats, chief of which was that of Obertyn (1531). The insolence of the Teutonic Order in invading Polish Prussia, was effectually chastised by S., who defeated their Grand Master Albert, his own nephew, in two great battles, in the latter of which the knights were assisted by the Danes (1520). In 1525 he agreed to confer on Albert the title Duke of Prussia (now known as East Prussia), on condition of fealty and homage: the dukes of Prussia continued vassals of the Polish crown till 1657. In 1526 S. alone of the monarchs of Christendom lent aid to Hungary against the formidable array of Solyman the Magnificent, and a numerous force of Polish cavaliers fought bravely on the fatal field of Mohacz (1526). The only other important event of S.'s reign was the introduction and extension of Lutheranism in Poland—which S did nothing to prevent, only taking precautions, sometimes severe, against its affecting the civil and political condition of the country. It is told of him that, when John Eck exhorted him to take severe measures with the Lutherans, whom he compared to goats among the sheep ('the faithful Catholics'), S. replied that he was desirous of being 'king of goats as well as king of sheep.' After a long and glorious reign, S died at Cracow, leaving the character of a just, wise, and magnanimous prince, who had restored to his country its ancient prosperity, and had raised it from the very feet of its enemies to a commanding power over them.

SIGLA, n. plu. *sĭg'la* [L.]: the signs, characters, abbreviations, or letters used for words in ancient manuscripts, printing, coins, medals, and the like.

SIGMA, n. *sĭg'mă* [the Greek letter Σ or ς]: the Greek letter = Eng. S. Sig'moid, a. *-moyd*, or Sigmoid'al, a. *-moyd'ăl* [Gr. *sigma*, the letter S, and *eidos*, a form]: curved like the Greek Σ; in *anat.*, applied to several structures in the body, from their shape; in *bot.*, curved in two directions like the letter S, or the Greek Σ. Sigmate, v. *sĭg'māt*, to increase by adding the letter sigma.

SIG'MARINGEN: see HOHENZOLLERN.

SIGN, n. *sīn* [F. *signe*, a sign, a signature—from L. *signum*, a mark]: that by which a thing is known; a token. a wonder; a miracle; a symbol; a gesture instead of words; any significant mark; something intended to serve as a proof or type; indication; a picture or symbol set up on a house to show the tenant's occupation; a visible representation; in *astron.*, the twelfth part of the ecliptic; in *alg.*, a character or symbol indicating the relation between quantities; in *med.*, anything by which the presence of disease is made known: V. to attach one's name to; to ratify by signature or seal; to indicate by a sign; in *OE.*, to be a sign or omen. SIGN'ING, imp.: N. act of one who signs or affixes a signature (see SIGNING, SEALING, AND DELIVERY). SIGNED, pp. *sīnd.* SIGN'ER, n. *-ėr*, one who signs. SIGN-BOARD, a board hung up with painted designs to indicate a man's calling. SIGN-MANUAL, signature in handwriting, authenticating a document. SIGN-MANUAL, ROYAL, superscription or subscription of the sovereign, which in Britain must be adhibited to all writs which have to pass the privy seal or great seal. The sign-manual, in practice, consists but of the initial of the sovereign's name, with the letter R added, for *Rex* or *Regina*. SIGN-POST, a post or pillar on which a sign is hung. SIGNS OF THE TIMES, occurrences which indicate coming events. SIGNS OF THE ZODIAC, Aries, Taurus, Gemini, Cancer, Leo, Virgo, Libra, Scorpio, Sagittarius, Capricornus, Aquarius, Pisces, each of which see. NATURAL SIGNS, pantomimic and other easily understood signs to represent things.—SYN. of 'sign, n.': token; emblem; wonder; miracle; prodigy; monument; memorial; constellation; note; mark; symbol; representation; device; symptom; indication; type; omen; prognostic; presage; manifestation.

SIGNAL, n. *sĭg'năl* [F. *signal*, a signal—from mid. L. *signālĕ*—from L. *signum*, a sign]: anything employed to attract the eye or ear of others at a distance; notice given by a sign (see SIGNALS): in *OE.*, token: ADJ. distinguished from what is ordinary; memorable; notable: V. to convey by signals. SIG'NALLING, imp. SIG'NALLED, pp. *-năld.* SIG'NALS, n. plu. *-nălz*, a system of signs or tokens addressed to the eye, as flags, boards, lights, etc., for establishing communications at distances (see below)—now generally superseded on land by the electric Telegraph (q.v.). SIG'NALLY, ad. *-lĭ*, eminently; remarkably. SIG'NALIZE, v. *-năl-īz*, to make remarkable; to render distinguished above what is common. SIG'NALIZING, imp. SIG'NALIZED, pp. *-īzd.* SIGNAL-FIRE, a fire intended for a signal. SIGNALMAN, a man who has the charge of a signal or set of signals. SIGNAL POST OR STAFF, a long pole upon which a flag or pendant may be displayed for conveying signals.—SYN. of 'signal, a.': remarkable; memorable; notable; conspicuous; eminent; extraordinary.

SIG'NALS. means of rapidly transmitting intelligence to a greater or less distance by the agency of sight or hearing. Incomparably the most powerful medium yet known for this purpose is the electric current: see TELEGRAPH. Sound-S. have obviously but a short circuit. The electric current requires fixed apparatus establishing an actual communication between the two points, and is therefore inapplicable to the ordinary cases of ships interchanging S with one another or with the shore; and, except under unusual circumstances, it has not been found applicable to armies manœuvering in the field. For these purposes, so far as present knowledge extends, S. by sight or sound must be the resort. For railway-S., see below: also RAILROADS.

The ancients seem to have elaborated a system of night S. by torches for military purposes; but in naval affairs the ships sailed so close together that orders could be communicated by word of mouth, while the turning of a shield from right to left sufficed as sailing directions to the several lines. In modern times, signalling between ships has become indispensable; but there is probably no department of practical science in which progress has been slower, and every so-called system has been distinctly lacking in system. In the time of James II., a signal could be expressed only by flags, in confusing number, hung in different parts of the vessel. At the beginning of the 19th c. the system had been adopted of hanging a number of flags under one another, each symbol or combination having an arbitrary conventional meaning attached to it. Alterations in the specific flags have been made from time to time, but essentially this is the system now in naval use. The flags are either square, triangular of the same length, or pendants pointed and longer. These are black, white, red, blue, and yellow (in the Austrian service alone green is added), in mass or in combination. Specimens of the flags in use in the present naval code are shown in fig. 1. The signal-men find, however, that at a distance blue, red, and black are not readily distinguishable, nor yellow from white. It has consequently been the recent tendency to reduce all the signs to black and white, singly or in combination, trusting to shape for different signals.

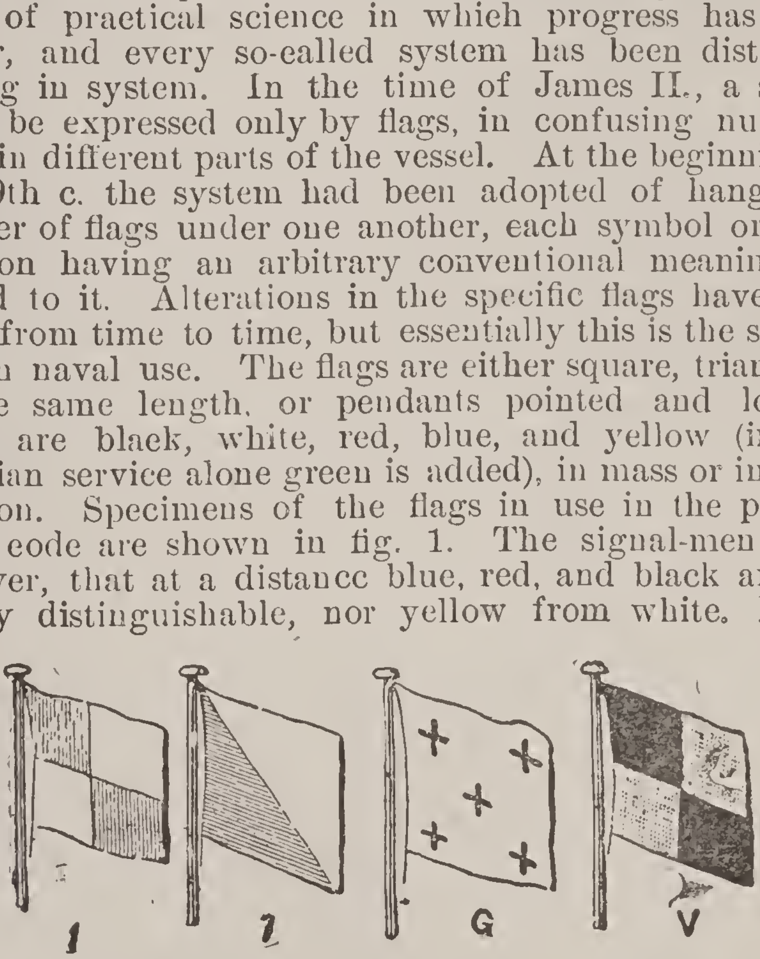


Fig. 1.

There are, however, disadvantages attending flags In a still day, they are difficult to read; or the wind may so blow that they are seen only end on. At sea, the motion of a ship will generally neutralize these drawbacks; but the case is otherwise on shore, and it may consequently occur that the ship can communicate to the land, but cannot get reply. To obviate this, S. representing solid figures are sometimes employed. To fulfil their conditions, they must appear the same in whatever lateral direction seen. But this limits the shapes to cylinders, cones, and the sphere, or to combinations of those figures; and as the total number of distinguishable signs is reduced, signalling becomes reduced from the word-signal to the telegraph. This distinction should be clearly understood, as much is involved in it. A word-signal, as in the present system, is where the whole word or message is sent up at once, and flies simultaneously; a telegraph-signal is one in which the letters composing the word, or number representing the signal, are shown separately, each being removed before another is shown. At sea, the word-system is best, for it involves no act of memory; and memory, even from signal to signal, is found difficult by signalmen in the turmoil of storm or fighting. On the other hand, the telegraph-system involves far simpler apparatus, and the changes can be effected more rapidly. As regards the actual time required for a message, the word-system has advantage in a message short enough for the whole to be shown at one time; otherwise the difference is not material. If all advantages be balanced, probably the telegraph-system will eventually supersede the other. Whether the word or the telegraph system be practiced, another question is, whether to spell each word, or to use numerals and a code. Under the latter principle, about 14,000 of the words and sentences most commonly sent are arranged for easy reference in the signal-book. With the addition of 1 or 2 repeating symbols, the 9 numerals and 0 give combinations 4 together to this number. A combination of figures is arbitrarily assigned to each expression; and the expression is communicated by representing those figures in their proper order. With the book of reference at hand, and intelligent signalmen, there can be no doubt of the superior rapidity of the 'code.' A code has this further advantage, that the S. representing things and not words, it can be made international, the same symbols representing the same idea in every language. It is then necessary for universal signalling only that each nation should concur in the meaning to be attached to the several signs. Much attention has been given of late years to the simplification of S.; the chief object having been so to simplify the telegraph-system that S. may be made with any apparatus, or without apparatus at all. To accomplish this, inventors have to a great extent abjured color, and resorted to form and motion. Among the form-telegraphs there is the principle of the old Semaphore (q.v.), in which each letter or number is shown by the position of two arms, as in fig. 2. The

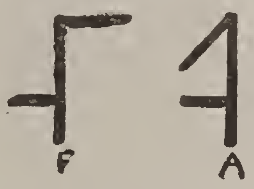


Fig. 2.—Semaphore System.

arms are heavy and involve mechanism; besides which, they are not always clear on a ship in motion beyond a short distance. Very superior in visibility and simplicity is Redl's System of Cones. This consists of 4 cones fixed to a mast. The cones are collapsable, and are formed in a similar manner to umbrellas. Their usual condition is shut, and they can be held open only while a rope attached to each is pulled. With cones of 3 ft. base, signalling is rapid and clear as far as 5 m., and the mast can be inserted at any place. The system is very simple: each cone represents a number, 1, 2, 3, or 4; then 1 and 4 shown represents 5; 2 and 4, 6; and so on, as in fig. 3. This elegant system can be applied in military or naval operations.

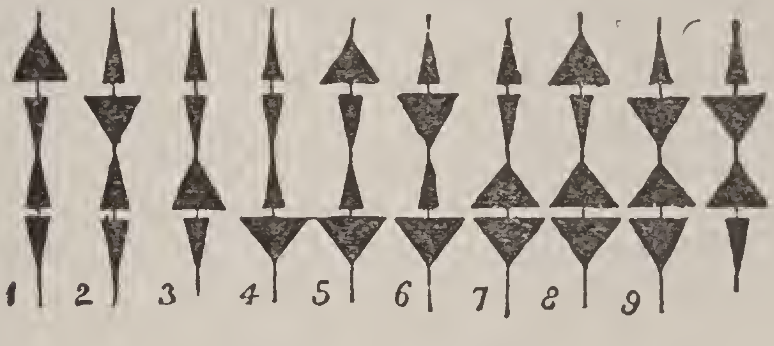


Fig. 3.—Cone System.

But its chief beauty is, that a person understanding it can make the same signals without the cones—e.g., if a black flag represent an open cone, and a white flag a shut cone, a ship with 4 black and 3 white flags can make every signal. Again, the arm raised horizontally may represent the open cone; against the body, the shut cone; then two men standing on a cliff are as good as any signal-post—

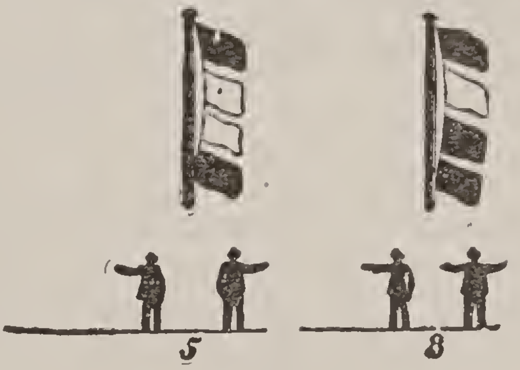


Fig. 4.

see fig. 4 Or if one person only be present, he may represent an open cone by raising his arm with a handkerchief extended, and a shut cone by his arm without the handkerchief. He has then only to raise his arm four times in quick succession, with or without the handkerchief, to make the required signal. We have thus arrived at a universal system of the utmost simplicity, which in war, and especially during invasion, might be of inestimable benefit if generally diffused by the government.

It remains to apply the same system to night-signals. The old naval principle has been to hang dingy lanterns in various shapes—triangles, squares, crosses, etc. Besides requiring large bases to be at all visible, this has been found nearly useless by reason of the motion of a ship. Redl's system has been applied by hanging four lanterns in a vertical line to represent the cones, and obscuring those which corresponded to shut cones. An improvement was the introduction of a red or green light in the middle, to show the relative positions of the four. The best night-S. are, however, flashing lights, as introduced by Col. Bolton, and more elaborately by Capt. Colomb (both of the Brit. navy), and adopted in the navy. This signal consists of a bright light, covered by a shade, which shade, by mechanism, can be lifted for any given time, exposing the light meanwhile. A flash of about half a second's duration is negative; a line of 1½ seconds, positive Four exhibitions of the light then represent a symbol as in Redl's cones. If the same nomenclature be adopted, we should signal as in fig. 5. It will be seen at once that this system produces results similar to Morse's Electric Telegraph. If the distance be within a mile or so, and the weather still, a bugle will answer equally well, long and short notes representing the positive and negative cones.

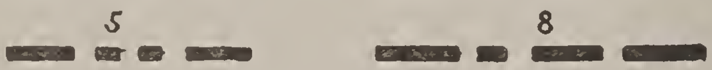


Fig. 5.

Heliography is now largely used for military signalling where there is plenty of sunshine. The heliograph is simply a mirror on a stand, capable of being swung horizontally as well as vertically, with a small hole in the mirror to look through, so as to direct it accurately, Two trained sappers with heliographs can easily flash signals to one another at a distance of 50 m., and so communicate even without the help of a telescope. See HELIOTROPE—HELIOSTAT—HELIOGRAPH.

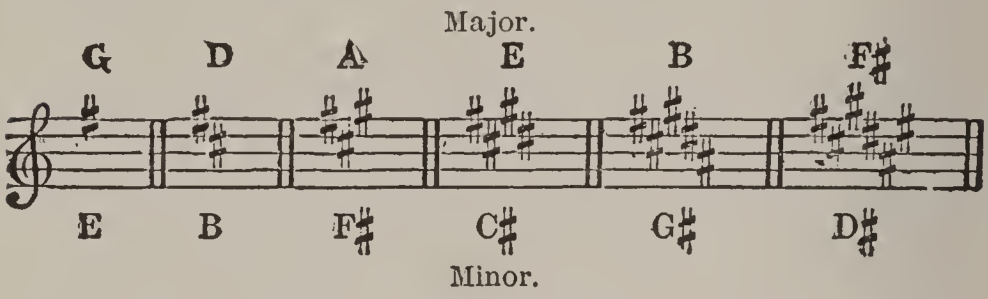
AUTOMATIC RAILWAY-SIGNALS.—The system of automatic block-signalling has been extensively introduced on crowded sections of American railways. It involves the use of a pneumatic system for moving semaphores placed at the block limits. The action of the compressed air is regulated by valves operated by electricity. The rails of the road are used as conductors. A copper wire is carried across the adjoinings, and is secured by pins driven into the web of the rail. This insures good connection. At the end of each block the wire is omitted, and an insulating piece inserted between the rail-ends. The semaphores are fitted with counterpoise weights which tend to draw them into the danger position. An air-cylinder with piston is so connected to the semaphore as to move it into the safety position when air enters. The air is admitted to the cylinder through a valve actuated by a solenoid coil, the valve-stem acting as the core of the solenoid. When a current is passing, the valve is held open. Included in the system are an air-compressing station with pipes leading to the different semaphores, and line-batteries actuating relays, which control local batteries for operating the air-valves. As long as a block is unoccupied by a train, the electric current passes, holds the valve open, and the air-pressure maintains the semaphore in the safety position. When an engine comes upon the block it connects the two rails electrically and cuts off or 'short-circuits' the current so that none or very little goes to the semaphores. Consequently the valve closes, and at the same time an outlet is provided for the compressed air in the cylinder. At once the semaphore is raised by the counterpoise weight, and shows danger. The train as it leaves the block permits the current once more to act on the air-valve. It opens it and closes the escape. The air enters the cylinder and forces the semaphore into safety. It is usual to have two semaphores at the beginning of each block. One is actuated by a train on its own block, and indicates danger; the other is so connected as to be actuated by a train on its own and also on the next block, so that it indicates a train over a block removed, and is interpreted as caution. The general system has, as an important feature, the making any accident to the electric circuits or air-pipes set the signals at danger. The blocks for crowded roads may be very short.

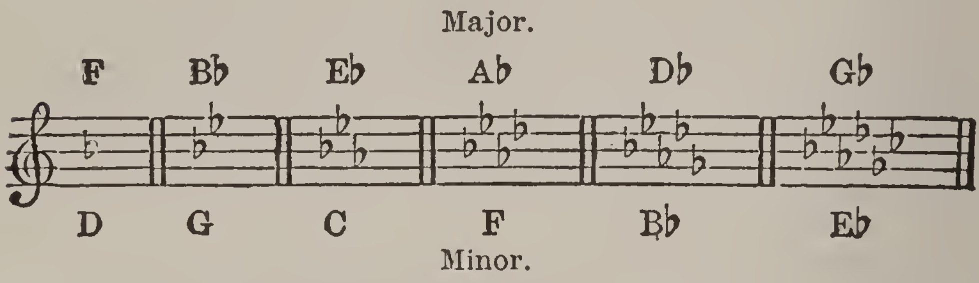
SIGNAL SERVICE OF THE UNITED STATES: see METEOROLOGY: STORMS.

SIGNATORY, a. *sĭg'nă-tėr-ĭ* [L. *signātor,* a witness to a will by signing it; *signārĕ,* to seal (see SIGN)]: relating to a seal, or signing a name: N. one who signs his name to a formal authoritative document, as to an international treaty.

SIGNATURE, n. *sĭg'nă-tūr* [F. *signature*—from L. *signātus,* set a mark upon, sealed; *signārĕ,* to seal (see SIGN): It. *segnatura*]: name of a person written or subscribed by himself; a sign or mark impressed: in *music* (see below): in *printing* (see below).

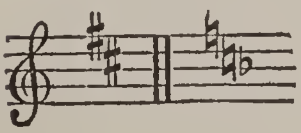
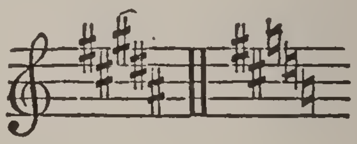
SIG'NATURE, in Music: sharps or flats placed after the clef to indicate the key of the piece. In writing music in any key with sharps or flats, the sharps and flats belonging to the key, instead of being prefixed to each note as required, are placed together immediately after the clef on the degrees of the staff to which they belong (see KEY). The signatures of the several keys generally in use are as follows:





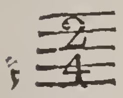
The minor keys take the same S. with the major keys a third above them.

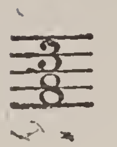
When a new key is introduced in the middle of a piece of music, the S. of the former key must be contradicted, and that of the new one appended. Thus a transition from the key of D major to that of D minor is indicated thus:

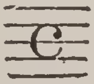
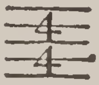

; from B major to B minor:

;

the sharps which are to continue being, in this last case, for distinctness' sake, appended in addition to the contradiction of those that are to be discarded. A transition to another key which is not to continue for any length of time is seldom indicated by a change of S.; but the sharp, flat, or natural sign is appended to any note as required, that sign affecting all the following notes of the same letter in the measure in which it occurs, unless contradicted: a sharp, flat; or natural thus introduced is called an accidental. Two accidentals are required in the ascending scale of every minor key, to sharpen the sixth and seventh of the tonic.

Besides the S. of the key, a S. of time precedes every musical composition: it consists of two figures placed over one another as a fraction, the denominator 2, 4, 8, or 16 standing for minims, crotchets, quavers, or semiquavers (i.e., halves, fourths, etc., of a semibreve), while the numerator points out how many of these fractional parts of

a semibreve are contained in each measure. Thus 

indicates that there are two crotchets, and 

three quavers, in the measure. When there are four crotchets (or a semibreve) in the measure, it is usual to write  instead of 

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SIG'NATURE, in Printing: letters or figures placed at the bottom of the first page of each sheet of a book, to facilitate arrangement of the several sheets in the volume by indicating their number and order. The letters employed are those of the alphabet, except J, V, and W, three letters which have been invented since the use of signatures was introduced (see ALPHABET). As the first sheet of a work, containing the title-page, dedication, preface, etc., is generally printed last, the letter A is sometimes reserved (with small letters, *a*, *b*. etc., should there be more sheets of introductory matter) for this, and the signatures commence with B; after reaching Z, they begin again at the beginning of the alphabet, the letter being doubled for distinction, as AA, or A*a*, or more frequently 2A. Should the alphabet again be exhausted, 3A, 3B, etc., are next employed, and so on. This has been the method usual in Britain; in the United States, France, and Italy, figures are more common. Signatures are placed also on certain pages of the same sheet, as a further direction to the bookbinder. The use of signatures is not universal.

SIGNET, n. *sĭg'nĕt* [OF. *signet*, a signet, seal, stamp; F. *signe*, a sign or mark—from L. *signum*, a mark]: in England, the seal used by the sovereign to authenticate private letters and grants. Formerly all royal warrants had to pass through the Signet-office; since 1848 the royal sign-manual, countersigned by one of the principal secretaries of state, suffices as authority for affixing the privy seal; and the Signet-office has been abolished. SIGNET-RING, finger-ring having a stone engraved with a crest or monogram. WRITERS TO THE SIGNET, usually contracted into W.S., in *Scotland*, a body of legal gentlemen who formerly had charge of the king's signet, with exclusive privilege of signing all summonses for citing parties to appear before the court of session, and other writs that pass the signet, conducting also general law business, and acting as agents in cases before the court of session—their functions and privileges have now been largely transferred to a body of 'law agents,' whose business corresponds nearly to that of attorneys and solicitors (see WRITER TO THE SIGNET).

SIGNIFICANT, a. *sĭg-nĭf'ĭ-kănt* [L. *significans* or *significan'tem*, showing, pointing out; *significā'rĕ*, to show or point out—from *signum*, a mark, a sign; *faciō*, I make: It. *significante*, significant]: expressing something beyond the external mark; expressing some fact or event; forcible to express the intended meaning; betokening; standing as a sign of something important; momentous: N. in *OE*., that which expresses a meaning deeper than appears by the external sign; a token. Signif'icantly, ad. *-lĭ*. Signif'icance, n. *-kăns*, or Signif'icancy, n. *-kăn-sĭ*, meaning; import; power of impressing the mind; importance; moment. Signification, n. *sĭg'nĭf-ĭ-kā'shŭn* [F.—L.]: act of making known by signs or words; meaning; sense; import. Signif'icative, a. *-kă-tĭv*, having signification or meaning; strongly expressive of a certain idea or thing. Signif'icatively, ad. *-lĭ*. Signif'icativeness, n. *-nĕs*, the quality of being significative. Signif'icatory, a. *-kā-tér-ĭ*, having meaning. Signify, v. *sĭg'nĭ-fī* [F. *signifier*, to signify—from L. *significārĕ*]: to have or contain a certain sense; to denote; to mean; to make known; to express or declare by a token; to have consequence. Sig'nifying, imp. Sig'nified, pp. *-fīd*. It signifies nothing, or It does not signify, it is of no importance.—Syn. of 'signify': to express; imply; testify; intimate; involve; manifest; declare; utter; betoken; denote; mean; import; weigh.

SIGNING, SEALING, and DELIVERY, of a Deed: formal, legal mode of executing a deed. In England, the main acts are sealing and delivery, for signature is not absolutely essential—at least in some kinds of deeds. In the United States, signing is commonly required by statutes; even when it is not so required, the signature is always added for greater security. The use of the seal is an ancient form of authenticating deeds, still kept up in the United States and England, though long superseded in Scotland by simple subscription: see Seal, in Law. Delivery is the transfer of the deed from the grantor to the grantee or his agent; and it may be by acts alone, or by words alone: all that is essential is that there shall be intention to make delivery.

SIGNOR, n., or Signior, n. *sēn'yŏr*, Signora, n. fem. *sēn-yōr'â*: in *Italy*, a title of respect. Signory, or Signiory, n. *sēn'yŏr-ĭ*, lordship; dominion; used by Shakespeare for *seniority*: see Seignior.

SIGNORELLI, *sēn-yo-rĕl'lē*, Luca (full name Luca d'Egidio di Ventura; called also Luca da Cortona): about 1442–1524; b. Cortona: great Italian painter; forerunner by a few years of the supreme princes of Christian art, himself of the Tuscan and Umbrian school. He was apprenticed to Piero della Francesca; was painting at Arezzo 1472, at Citta di Castello 1474; may have been in Rome 1478–84, when he returned to Cortona, where he was a prominent magistrate as early as 1488 and at his death there, though he made professional tours from 1497 on. He was commissioned by Pope Sixtus to paint some frescoes, now obscured, in the shrine of Loretto, the subjects being from N. Test. history. In the Sistine Chapel, Rome, the *Acts of Moses* is from his hand; in the convent of Chiusuri at Siena, 8 frescoes of the life of St. Benedict; in the palace of Pandolpho Petrucci, mythological subjects. But his greatest works are in the chapel of St. Brizio at Orvieto.

SIGNUM, n. *sĭg'nŭm* [L., a sign]: in *law*, a cross prefixed as a sign of assent and approbation to a charter or deed.

SIGOURNEY, *sĭg'ėr-nĭ*, Lydia (Huntley): author and poet: 1791, Sep. 1—1865, June 10; b. Norwich, Conn.; daughter of a soldier of the revolution. She was well educated, and, like most young ladies of ability in New England at that period, early engaged in teaching, in Hartford. In 1819 she was married to Charles Sigourney, merchant in Hartford. Her poetry, though not ranking with productions of the highest class, was a graceful and pleasing transcript of her own beautiful character. She was noted for philanthropy, which she was accustomed to carry to the point of self-denial in the aid of the needy. In 1822 she published a descriptive poem on the *Traits of the Aborigines of America;* and 1824, *Sketch of Connecticut Forty Years Since.* These were followed by *Pocahontas and other Poems, Lays of the Heart, Tales in Prose and Verse,* etc. In 1840 Mrs. S. visited Europe, and on her return wrote *Pleasant Memories of Pleasant Lands.* Forty-six books were ascribed to her pen. She compiled amusing and instructive works for the young, and was a constant contributor to magazines and other periodicals of poems and prose articles (to nearly 300 periodicals more than 2,000 articles), whose subjects, style, and sentiment gave her the designation 'the American Hemans.' Some of her books were widely read in England. She died at Hartford.

SIGSBEE, Charles Dwight: naval officer: b. Albany, N. Y., 1845, Jan. 16; graduated at Naval Academy 1863; served in West Gulf Squadron 1863-64; promoted lieut.-comd'r 1868; commodore 1882; with coast survey 1874-78; sounded and explored Gulf of Mexico. He devised new methods in deep sea exploration for which he received the order of the Red Eagle of Prussia from Emperor William. He was promoted captain 1897; commanded the battleship Maine; and later the cruiser St. Paul in operations against Spain; captured Cervera's coal ship; commanded the battleship Texas 1898-1900; made chief officer of naval intelligence; rear admiral 1903. Author of *Deep Sea Sounding and Personal Narrative of the Battleship Maine.*

SIHUN': see Jaxartes.

SIKE, a. *sīk:* OE. for Such.

SIKHS, or SEIKS, n. plu. *sēks* [corruption of Skr. *s'ishya*, disciple]: warlike people in Hindustan, inhabiting the Punjab (q.v.), in n. India. Less commonly, even among themselves, the members of this community are known also as Sinhs (vulgarly Singhs), that is, 'lions,' title given them by Govind, last and most influential of their hierarchs. Every name of a Sikh male now terminates with the word Sinh.

Originally a body of mere religionists, the S , from the energy which they developed under repression, and the inducements to join them which they offered as proselytizers, grew in strength and numbers, and became a formidable nationality. Their originator, Nânak (1469-1539), was born, and died, near Lahore. To him succeeded, in turn, nine pontiffs, each of whom, like himself, is popularly denominated guru, or 'teacher.' These were Angad, Amardâs, Râmdâs, Arjunmall, Hargovind, Harrây, Harkrishna, Teghbahâdar, and, finally, Govind.

The aim of Nânak was pointedly humanitarian, and designed to combine Hindus and Mohammedans, at the cost of what he held to be only unimportant compromise, into one harmonious brotherhood. The comprehensive character of his scheme is proved by his accepting concurrently the incarnations of Neo-Brahmanism and the mission of the Arabian prophet Mohammed. His three immediate successors, while zealously protecting the interests of the infant sect, avoided secular pursuits, and held aloof from political complications. Arjunmall, however not content with signalizing himself as compiler of the *Âdigranth* and as founder of Amritsar, the holy city of the S., engaged in trade, and was a conspicuous partizan of the rebellious Prince Khusrû. Hargovind, his successor, called the S. to arms, led them in person to battle, and, though he remitted nothing of his assiduity as a guru, became an active, though sometimes refractory, adherent of the Great Mogul, against whom his predecessor had plotted. Harrây subsequently espoused the part of Dârâ Shukoh when contending for the throne of India. Harkrishna, son of Harrây, died a child, and was only nominally a guru. Teghbahâdar, after a turbulent career, was executed as a rebel, by command of Aurungzebe, at Delhi: he probably contributed much in preparing for the complete change of Sikhism effected by his son Govind. The chief motive that instigated Govind, the tenth of the 'teachers,' to bring about this change was, with some probability, a desire to avenge the ignominious death of his father. He resolved to combat the Mohammedan power and, in deviation from the principles enunciated by Nânak, the Mohammedan religion as well. But Hinduism, with its social restrictions of caste, its fantastic fictions, and its irrational idolatry, likewise fell under his ban. God, he inculcated, is not to be found save in humility and sincerity. In what measure he was a man of thought is evinced by his legacy to his co-religionists, the second volume of the Sikh scriptures. A Sikh, it is therein taught, is to worship one God, to eschew superstition, and to practice strict morality, but equally is to live by the sword. The purport of this last injunction is unmistakable. Govind was assassinated, while in the imperial service, 1708, on the banks of the Godâvarî. He had stirred his followers to an ambition for political independence—an idea which was ultimately transformed into a reality. His successor, but only as a temporal leader, Banda, suffered a cruel death: he did little to advance his sect; and his memory is not held in reverence.

With the decline of the Mogul empire, the might of the S., in spite of their intermittent reverses, steadily increased, until, 1764, they convened a general assembly, formally assumed the character of a substantive nation, and issued coin from which the name of the emperor was omitted. Their commonwealth was still denominated, as it had been by Govind, Khâlsa; and the component states of the federation, ordinarily said to have been 12 in number, were thenceforward distinguished as Misls. Foremost in influence was the state of Sukarchakiyâ, whose chieftain was Mahâ Sinh, for whose son, the famous Ranjit Sinh (Runjeet-Singh, q.v.), it was reserved to consolidate the Misls into a unity under his own undivided control. The virtual headship of Ranjit Sinh dates from 1805, though not till 1838 did he attain the zenith of his ascendency. He died in the year following, at the age of 59. During 1845 and 6, the S. met the force of British arms, and ceased to exist as a nation; and their country has since been ruled by the English: see SIKH WARS. Yet every loyal Sikh is still confident that his people is suffering but a transitory depression and is destined to retrieve, and even to surpass, its bygone glory. In the mean time, the reputed son of a wife or concubine of Ranjit Sinh, Dilîp Sinh, became a pensioner of the British govt., professed Christianity, and took up his abode in England.

Ethnologically considered, the S. are, in large proportion, of Jât origin; the Jâts, whom some take to be one with the classical Getæ, being a tribe extensively diffused over n. India. But other Hindus have helped to swell their ranks, also not a few Mohammedans. The ten gurus are accounted Kshatriyas, or of the second Brahmanical caste, the martial. The descendants of these several races, from intermarriage and other causes, cannot, however, now be discriminated; and there is no division of the multiform population of India that exhibits physical uniformity more than the S. For symmetry and comeliness, as well as courage and endurance, the Lions of the Punjab are altogether remarkable.

Nânak's was, undoubtedly, by far the most successful of the repeated attempts which have been made to fuse together the incompatible dogmas of Hinduism and Islamism. None of the authors of these attempts seem, indeed, to have been acquainted with more than the mere surface of the two religions which they would have blended into one. With the Mohammedan, the existence of the Deity as a pure spirit, and his creatorship of the world, are fundamental postulates. On the other hand, the radical doctrine of the Hindu is pantheism, agreeably to which the universe, alternatively God, is a single eternal substance, under the twofold aspect of spirit and matter. These sets of first principles, which Nânak and his fellow-reformers could never have clearly apprehended, are palpably impossible of reconciliation. Without rejecting all that is distinctive of his creed, no Hindu can assent to the theology of Islam; and, conversely, every intelligent follower of the Arabian prophet must be aware that the monism and the metempsychosis of Brahmanism are utterly antagonistic to the leading positions of his own faith. Govind, as we have seen, openly repudiated the notion of amalgamating Hinduism and Mohammedanism. An opportunity of becoming acquainted with his real views and those of Nânak, in their fulness, has been provided for English readers by Dr. Trumpp's translation (London 1877) of the *Adigranth* (the Original Record). The *Granth* contains also extensive quotations from Kubir and other predecessors of Nânak. A second *Granth*, by Guru Govind Sinh, has not yet been translated. These voluminous compositions are metrical throughout, and are in an archaic Indian vernacular, older than Hindi and Panjabi. They are written in the same character as the Sanskrit, the values of the letters being altered, though their forms are retained.

Among the numerous divisions into which Sikhism, as a system of belief and practice, has ramified, two, at least, apart from the great central sect, deserve specification. First are the Udâsîs, professors of indifference to mundane concerns—a sect whose origin is attributed to S'rîchand, son of Nânak: these recluses, whom Amardâs refused to recognize as genuine S., have, to this day, numerous disciples. The Akâlîs sprang up just after the time of Govind: for extravagance of fanaticism, these Ishmaelites have, it is hoped, no rivals; and the style of their piety is comparable with that of a Thug.

As specimens of the superstitions of the S., it may be noted that, like the Hindus, they regard the eating of beef a deadly offense, and that, like the modern followers of Zoroaster, they attach sinfulness to the act of extinguishing a light with the breath. Of the gurus, Amardâs humanely discountenanced the cremation of widows, and Arjunmall committed suicide. The morality of ordinary S. is as positively maintained by one class of writers as it is denied by another. Evidence seems to show that the agriculturists among them are much on a par, as to correctness of life, with other Indian cultivators of the soil. As to their soldiers, however, it has been observed that they are deeply tainted with those repulsive impurities for which the Persians are infamous. Though forbidden the use of tobacco, they are under no restriction as concerns indulgence in bhang, opium, and intoxicating drinks. In morality there is reason to believe that they have greatly degenerated since the days of Govind.

The gross Sikh population has been most variously estimated by different statisticians, some computing it at considerably less than half a million, while others deem a million and a quarter, or even a million and a half, not excessive.

For the most satisfactory extant treatment of the S., see Capt. J. D. Cunningham's *History of the Sikhs;* Sir J. Malcolm's *Sketch of the Sikhs; The Asiatic Researches*, I., XI.; the collective works of Prof. H. H. Wilson, I., II.; *The Calcutta Review*, XXXI., XXXIII.; and Dr. Trumpp's *Die Religion der Sikhs* (1881).

SIKH WARS, *sēk:* two brief but desperate contests between the British power in India and the Sikhs, 1845–6, 1848–9, which resulted in the destruction of the Sikhs as an independent nation. The first had its origin in the dissensions which convulsed the Sikh country after the death of Runjeet-Singh (q.v.), and which necessitated the exercise of a wary regard on the part of the Calcutta authorities. At length an army of Sikhs, flushed with their triumph over all lawful authority in their own country, crossed the Sutlej, and extended their ravages over British territory; but their advanced guard was met by Sir Henry Hardinge, gov.gen., at the head of four regiments of infantry and one of dragoons, and routed at Mudki (q.v.) with heavy loss. Three days later, their main body, which had meantime crossed the river and intrenched itself at Feroze Shah (q.v.), was attacked by a larger force of British under Gough and Hardinge, and after a bloody conflict, which lasted two days, also routed. Still undismayed, they again intrenched themselves at Sobraon; but a fresh body which had just crossed the Sutlej at Aliwal (q.v.), 19,000 strong, with 68 pieces of cannon, was wholly routed and driven across the river by Sir Harry Smith, at the head of 7,000 men, with 32 guns; and their main body was soon afterward similarly dispersed at Sobraon (q.v.). The British then crossed the river, took Lahore, and restored the authority of the young Maharajah, from whom they took the territory between the Beas and the Sutlej, the treaty confirming this settlement being made at Lahore, 1846, Mar. 9. But the internal disturbances in the kingdom of Lahore soon became as active as before, and induced the Maharajah's prime minister to put the country under the E. India Company's protection; and a residency with a guard of regular troops was then established in the capital. 1848, Apr. 20, two British officers were murdered by a Sikh chief, the dewan Moolraj of Multan; and as this was found to be but a premonitory symptom of a general outbreak, a small force of British under Lieut. Edwardes, aided by a body of Sikhs under the Rajah of Bhawalpûr, gallantly attacked the army of Moolraj, which, after a desperate conflict of nine hours, they defeated June 18; and—both sides in the mean time having received reinforcements—again on July 1. Multan was then besieged; but the defection of 5,000 auxiliary Sikhs under Shere Singh (son of the Sirdar Chuttur Singh, gov. of Hazara, who had been for some time in revolt, and had driven the British from his district) compelled the British to retreat. For some time the British authorities in the Punjab were hampered by lack of military force; and though the Maharajah and much of his army still opposed the Sikh rebels, little reliance could be placed on most of it. Shere Singh now succeeded in raising his army to 40,000, but was defeated by Lord Gough at Ramnuggur (Nov. 22). The inconsiderate haste of Gough at Chillianwalla (Jan. 13) nearly lost him that great battle, which was saved only by the extreme valor of his soldiers; but amends for this fault were made at Gujerat (q.v.), where the power of Shere Singh and his allies was completely broken. Meanwhile the fortress of Multan had, after protracted bombardment, been captured; and the company, seeing no other mode of protecting their territories from these warlike fanatics, annexed the Punjab, 1849, Mar. 29, thus terminating the existence of the Sikhs as an independent nation.

SI-KIANG, *sē-kē-âng'*, or Western River: river at the s. extremity of China Proper. It is navigable for vessels not drawing more than 16 ft. of water for about 100 m. from its mouth. The S. is remarkable for the purity and clearness of its waters.

SIKKIM, *sĭk'ĭm:* small protected state in n.e. India, bounded w. by Nepaul, and s.e. by Bhotan: 2,544 sq. m. Pop. about 50,000.—The dist. immediately s., of which Darjeeling (q.v.) is cap., is often called British Sikkim: it was mostly taken from the Rajah of S. 1850, in punishment for an outrage on British subjects.

SILE, v. *sīl* [Sw. *sila*, to strain, to filter: Low Ger. *silen*, to drain off water]: in *OE.*, to ooze through; to drip; to sink down. Sil'ing, imp. Siled, pp. *sīld.* Silt, n. *sĭlt*, the sediment, ooze, or mud which settles from river or sea water in a river-mouth or estuary.

SILENCE, n. *sī'lĕns* [F. *silence*—from L. *silentĭum*, stillness, silence; *silens* or *silen'tem*, still, silent—from *silērĕ*, to be silent: It. *silente*, silent]: entire absence of sound or noise; temporary cessation of speech in man; stillness; muteness; quiet; habitual taciturnity; secrecy; oblivion; obscurity: V. to restrain from noise or speaking; to still; to appease; to stop; to put an end to; to cause to cease firing, as to *silence* a battery: Impera. or Int. let there be no speech or noise; hush. Si'lencing, imp. Si'lenced, pp. *-lĕnst.* Si'lent, a. *-lĕnt*, quiet; still; habitually speaking little; not mentioning; not acting; having no sound, as a letter; in *OE.*, wanting efficacy. Si'lently, ad. *-lĭ*, without speech; without noise.—Syn. of 'silent': dumb; mute; speechless; voiceless; noiseless; taciturn; quiet; still.

SILENE, *sī-lē'nē:* genus of plants of nat. order *Caryophyllaceæ;* with a tubular 5-toothed calyx; five notched or bifid petals, which terminate in a narrow claw at the base, spring from the stalk of the germen, and have each an appendage forming a *Corona* (q.v.) in the mouth of the corolla; ten stamens; three styles; the capsule 3-celled, 6-toothed, many-seeded. The species are numerous, natives mostly of temperate parts of the northern hemisphere, annual and perennial plants; some of them frequent in flower gardens. Our wild species have common names which are translated from their botanic, such as Pennsylvanian (or Wild Pink), Virginian (or Fire Pink), Royal Catchfly, Starry Campion, etc. Introduced species are the Night-flowering C., Sweet-William C., and Sleepy C. The BLADDER CAMPION (*S. inflata*), perennial, another species naturalized from Europe, growing wild in fields of the eastern states, has a branched stem fully 12 inches high, ovate-lanceolate bluish-green leaves, panicles of white flowers, and an inflated calyx, with a beautiful network of veins. The young shoots are sometimes used like asparagus, and have a peculiar but agreeable flavor, somewhat resembling that of peas: they are best when most blanched.—The MOSS CAMPION (*S. acaulis*) is a pretty little plant, with beautiful purple flowers growing in patches so as to form a kind of turf, one of the finest ornaments of higher mountains in Scotland.—Many species are popularly called CATCHFLY, from their viscidity, detaining small insects that light on them.

SILENUS, *sī-lē'nŭs*, in Anc. Mythology: a satyr, son of Pan and Gæa (the Earth); generally represented as chief of the Sileni or older Satyrs (q.v.), and the inseparable companion of Bacchus, with whom he took part in the contest against the Gigantes, slaying Enceladus. In most respects he seems to have resembled the other satyrs, being in addition noted for wisdom and power of prophecy. S. had a temple at Elis.

SILERY, n. *sĭl'ér-ĭ* [etym. doubt.]: in *arch.*, foliage carved on the tops of pillars.

SILESIA, n. *sī-lē'shĭ-a*: kind of thin, coarse linen cloth, named from the place of its original manufacture; a cotton material, usually twilled, used for dress-linings.

SILESIA, *sĭ-lē'shĭ-a:* province of the kingdom of Prussia, included in the German empire; s. of the provinces of Brandenburg and Posen: bounded e. by the Polish provinces of Russia and Austria, s. and w. by the Austrian provinces of Silesia and Bohemia and the kingdom of Saxony. It is divided into three govts: *Liegnitz*, in the w.; *Breslau*, in the e.; *Oppeln*, in the s.; and these are subdivided into circles: 15,666 Eng. sq. m. Pop. (1871) 3,707,144, of whom 1,896,136 were Rom. Catholics, 1,760,-341 Protestants, 46,629 Jews; (1900) 4,668,857. Of the pop., one-fifth speak Polish, more than 90,000 employ other Slavic dialects, and the rest use the German language. This province, largest and much the most populous of the Prussian provinces, is crossed from n.e. to s.w. by a broad strip of mountainous country, which widens out at each extremity; and along the whole e. boundary, and in the s., are ranges of low hills; in the n.w. and centre, the surface is flat and heathy, or sandy, with numerous stagnant pools. S. is almost wholly included in the basin of the Oder (navigable as far s. as Ratibor), which flows through it from s.e. to n.w., and receives from each side numerous tributaries; but a small portion in the extreme s. is drained into the Vistula, which here takes its rise. The soil is altogether fertile and well cultivated, more so, however, in Lower than in Upper S.; and cereals of all kinds, oil-plants, beets, hops, occasionally vines, and, above all, flax and hemp, are the crops of the province; but of late years the cultivation of tobacco, and of plants yielding dye-stuffs, has increased. Cattle and sheep, the latter excellent in quality and partly of pure or mixed merino blood, are reared in the highlands, the annual produce of wool averaging fully 140,000 cwt. The mines of S. are of great importance; iron, copper, and lead are chief products; coal is found in abundance. The manufacture of lace, averaging in annual value $7,500.000, is carried on in the mountainous districts, chiefly around Schweidnitz; and the production of other fabrics, e.g., linen, cotton and woolen goods, paper, iron, leather, glass, and earthenware, is vigorously carried on throughout the province. The Oder, and the great central railway from Berlin and Posen to Vienna, afford ample facilities for commerce. There are a univ. at Breslau, gymnasia in the principal towns, and a great number of professional and industrial schools.

S. was inhabited at the beginning of the Christian era by the Quadi and Lygii, who, like the other German tribes, advancing w. in the 6th c., were succeeded by Slavic tribes. It formed part of the Slavic kingdom of Moravia, was next joined to Bohemia, and in the beginning of the 10th c. to Poland. In 1163 it was separated from the kingdom of Poland, but was ruled by dukes of the royal line of Piast; these dukes, to repeople the country devastated by the numerous civil wars, encouraged the settlement of German colonies, especially in Lower S. The practice of division and subdivision of territory prevailed so extensively that at one time S. had no less than 17 independent dukes; and to save itself from reincorporation with Poland, it acknowledged the sovereignty of the kings of Bohemia, with which, and with Germany, from the time of Emperor Karl IV., it was indissolubly connected. In 1537 the Duke of Liegnitz, one of the numerous Silesian princes, entered into an agreement of mutual succession (*Erbverbrüderung*) with the Elector of Brandenburg, on the extinction of either reigning line; and the other ducal lines becoming gradually extinct, their possessions fell to Liegnitz or to Bohemia, or lapsed to the emperor. In 1675, when the last ducal family, that of Liegnitz, failed, its territories of Liegnitz, Brieg, and Wohlau, would have fallen to Prussia, but the emperor of Germany refused to recognize the validity of the agreement of 1537, and took possession of the Liegnitz dominions, as a lapsed fief of Bohemia. The remainder of S. was thus incorporated into the Austrian empire. In 1740 Frederick II. of Prussia, taking advantage of the helpless condition of Maria Theresa of Austria, laid claim, on the strength of the agreement of 1537, to certain portions of S.; and without declaring war, marched into and took possession of the province, maintaining his hold despite the utmost efforts of Austria 1740–42 and 1744–5, called the *first* and *second* Silesian wars. After the *third* Silesian war, better known as the Seven Years' War (q.v.), S. was finally ceded (1763) to Prussia.

SILE'SIA, Austrian: duchy and crownland of the Austrian empire, bounded n.e. by Prussia, s.w. by Moravia: 1,980 sq. m. It is mountainous in the w,. where the Spieglitzer Schneeberge, a summit of the Sudetic chain, rises 4,512 ft. The crownland comprises 1,806 sq. m. of level land, of which by far the greater portion is arable or in forest. The climate, though rough, is healthful; and the soil produces good crops of rye, oats, barley, flax, etc. Within the crownland rise the rivers Oder and Vistula. Cattle-breeding and bee-keeping are important industries; 110,000 head of sheep belong to the crownland. Iron, lead, and coal mining are profitably pursued. The manufactures are principally spirits, copper and iron wares and linen and cotton fabrics. Pop. (1890) 602,117; (1900) 680,422.

SILESIAN, a. *sī-lē'shan* or *-shĭ-an:* of or belonging to *Silesia*, a district of Prussia: N. a native or inhabitant of *Silesia.*

SILEX, n. *sī'lěks*, or Silica, n. *sĭl'ĭ kă* [L. *silex* or *silĭcem*, a pebble-stone, flint: F. *silex:* It. *silice*]: in *chem.*, flint; the oxide of the metal silicon; a mineral existing in the forms of flint, etc.; sometimes generically applied to any mineral in which silica is the principal constituent (see Quartz). Sil'icate, n. *-kāt*, a salt of silicic acid. Sil'icated, a. combined or impregnated with silica. Siliceous, a., or Silicious, a. *sĭ-lĭsh'ŭs*, resembling or containing silex; flinty. Siliceous sinter, an incrustation or deposit from springs holding silica in solution. Silicic, a. *sĭ-lĭs'ĭk* of or pertaining to, or obtained from, flint or quartz. Silicic acid, a name applied to *silica*, or a compound of silicon and oxygen, having certain of the properties of an acid. Silici-calcareous, a. *sĭ-lĭs'ĭ-kăl-kā rĕ-ŭs*, consisting of silica and calcareous matter; cherty. Siliciferous, a. *sĭl'ĭ-sĭf'ėr-ŭs* [L. *fero*, I bear]: producing silex or flint. Silicify, v. *sĭ-lĭs'ĭ-fī* [L. *facĭō*, I make]: to render siliceous; to petrify by silex; to become flinty. Silic'ifying, imp. Silic'ified, pp. *-fīd:* Adj. converted into flinty or siliceous matter. Silic'ifica'tion, n. *-fĭ-kā'shŭn.* the conversion of any substance into stone by siliceous matter, a common process in the neighborhood of hot springs holding silica in solution. Silicium, n. *sĭ-lĭsh'ĭ-ŭm,* more usually Silicon, n. *sĭl'ĭ-kon,* the base of silica, an elementary substance of a dark nut-brown color: see Silicon, below.

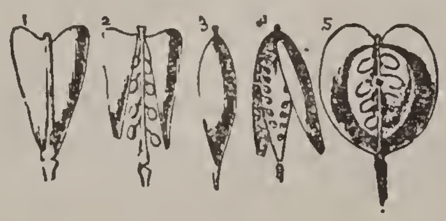
SILHOUETTE, n. *sĭl'û-ĕt'* [Fr., a meagre portrait, in allusion to Étienne de *Silhouette,* very economical French minister of finance]: profile or shadow-outline of the human figure or other object, filled in of a black or dark color, the shadows and extreme depths being sometimes indicated by the heightening effect of gum or other shining material. This species of design was known among the ancients, and was by them carried to high perfection, as the monochromes on Etruscan vases amply testify; but the name S. dates from about the middle of the 18th c., being taken from Étienne de Silhouette, French minister of finance 1759, who, to replenish the treasury, exhausted by the costly wars with Britain and Prussia and by excessive prodigalities, instituted numerous reforms and practiced the strictest economy of expenditure. His extreme parsimony in all finance matters made him a subject for caricature; so that any mode or fashion that was plain and cheap—'surtouts' without plaits, trousers without pockets—was styled *à la Silhouette;* and profiles made by tracing the shadow projected by the light of a candle on a sheet of white paper being then much in vogue, have continued to bear the name. Although without merit as a work of art, the S. presents a clear and well-marked profile, and such instruments as the Pantograph (q.v.), etc.,

Silhouette of Robert Burns.

were frequently employed to obtain profiles of a reduced size direct from the human features.—Profiles cut out of black paper with scissors also receive the name silhouettes.

SILICA, SILICATE, SILICIC, SILICIUM: see Silex: Silicon.

SILICLE, n. *sĭl'ĭ-kl*, or Silicula, n. *sĭ-lĭk'ū-lă* [L. *silic'ŭla*, a little pod—from *sil'ĭqua*, a pod or husk]: in *bot.*, a short pod formed like a Silique (q.v.), but about as broad



Silicles.

as long, or broader, occurring in many *Crucif'ĕræ*. Silic'ulose, a. *-lōs*, or Silic'ulous, a. *-lŭs*, bearing silicles; husky.

SILICON, *sĭl'ĭ-kŏn*, or SILICIUM, *sĭ-lĭs'ĭ-ŭm* (symb Si, at. wt. 28, spec. grav. of crystalline form 2·49): one of the non-metallic elements: see CHEMISTRY. Like carbon, S. assumes 3 different forms—the *amorphous*, the *graphitoid*, and the *crystalline*. It is the first of these, the amorphous S., which is obtained by the processes in common use, the second and third being obtained from this first modification.

Amorphous S. is a dull brown powder, which adheres to the finger, insoluble in water and in nitric and sulphuric acids, but readily soluble in hydrofluoric acid, and in a hot solution of potash. It is a non-conductor of electricity, and when heated in air or oxygen, its external surface burns brilliantly, and is converted into silica, which fuses from the extreme heat, and forms a coating over the unburned silicon. *Graphitoid* S. is obtained by exposing the amorphous variety to intense heat in a closed platinum crucible. This form of S. will not take fire when heated in oxygen gas, and resists the solvent action of all acids except a mixture of nitric and sulphuric; moreover, as another point of difference, it is a conductor of electricity. When vapor of S. tetrachloride, mixed with hydrogen, is passed over fused aluminium, the chloride is reduced, and the silicon dissolves in the aluminium: after a while the S. separates in large beautiful aciform crystals—*crystalline*, or *adamantine* silicon.

S., in a state of combination with oxygen, is the most abundant solid constituent of our globe; and in less proportion is an equally necessary ingredient of the vegetable kingdom; while in the animal kingdom it occurs in mere traces, except in a few special cases. It is never found in nature except in combination with oxygen. It was isolated first by Berzelius 1823. For our knowledge of the other modifications we are indebted to Wöhler and Deville.

S. forms only one oxide, SiO_2, the well-known compound silica or silicic acid. *Hydrated oxide of silicon* is represented by the formula $Si(OH)_4$. The hydrated oxide exhibits many interesting chemical properties, but is of no practical importance.

Silicic acid or *silica* exists both in the crystalline and in the amorphous form. The best examples of the crystalline form are rock-crystal, quartz, chalcedony, flint, sandstone, and quartzose sand. Silica in this form has a specific gravity of about 2·9, and is only attacked with difficulty by potash or hydrofluoric acid. The amorphous form exists naturally in opal, and is obtained artificially as gelatinous silica, etc.; it differs from the former in its specific gravity, being about 2·2, and in its being rapidly dissolved by potash and by hydrofluoric acid. Pure silica (as it occurs in rock-crystal, e.g.) is perfectly transparent and colorless, and sufficiently hard to scratch glass. The heat of the oxyhydrogen blow-pipe is required for its fusion, when it melts into a transparent glass, capable of being drawn out into elastic threads. Perfectly pure silica in its amorphous form may be obtained by various chemical processes. If a solution of silicate of potash or soda be treated with hydrochloric acid, the silicic acid separates as a hydrate; and on evaporating this to dryness, and treating it with boiling water, silicic acid remains as an amorphous powder, which, after being washed, dried, and exposed to red heat, may be regarded as chemically pure. The hydrated silicic acid mentioned in the above experiment is soluble in water, and (more freely) in acids and alkalies. The solubility of hydrated silicic acid in water accounts for the presence of silicic acid in mineral springs and in the Geysers of Iceland, as well as for its gradual separation from these waters in the form of petrifactions. That silica or silicic acid is a true acid (though a feeble one) is obvious from its uniting with bases, especially with those capable of undergoing fusion, and forming true salts known as silicates. These silicates occur abundantly in nature; all the forms of clay, feldspar, mica, hornblende, augite, serpentine, etc., being compounds of this description. Silicic acid combines with bases in various proportions. The following table (in which M stands for a metallic element), condensed from a more extended one in Watts's *Dict. of. Chem.*, shows the most important groupings of the silicates:

	Formula.	Examples.
Hemisilicates or Orthosilicates..	$2M_2O,SiO = M_4SiO_4$	Olivine,$(Mg,Fe)SiO_4$
Monosilicates or Metasilicates	$M_2O,SiO_2 = M_2SiO_3$	Diopside,$(Ca,Mg)SiO_4$
Sesquisilicates.........	$2M_2O,3SiO_8 = M_4Si_3O_8$	Orthoclase, $(KAl)Si_3O_8$
Di- or Bi-silicates......	$M_2O,2SiO_2 = M_2Si_2O_5$	Okenite, $CaSi_2O_5 + 2H_2O$

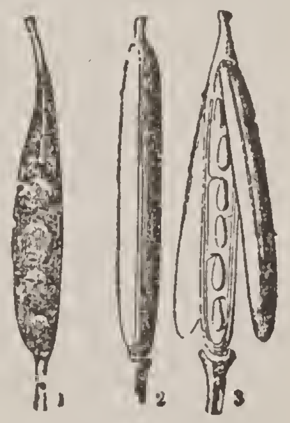
The following are the general characters of the silicates: Most of them are fusible, the basic silicates fusing more readily than those which are either neutral or contain an excess of acid. Except the silicates of the alkalies, no silicates are soluble in water. The anhydrous, neutral, and acid silicates of the earths resist the action of all acids except the hydrofluoric.

Silica derives its name from *silex*, flint, of which it is the essential constituent: it is largely employed in the manufacture of glass, china, and porcelain. For these purposes, it is obtained in finely comminuted state by heating flints or portions of colorless quartz to redness, and plunging them in cold water. The silica splits up into a friable mass, which may be easily ground to a fine powder. The use of silica in giving firmness and rigidity to various parts of the animal organs is exemplified in its free occurrence in the quill-part of the feather of birds, in the shields of certain infusoria, and in the spicula occurring in sponges; while its similar use in the vegetable kingdom is seen in its more or less abundant presence in the stalks of the grasses, particularly in the cereals and in the bamboo (where it is especially deposited about the joints and is known as *Tabasheer*), in the equisetæ, etc.

S. may be made to combine with several other elements besides oxygen; but with the exception of silicofluoric acid, these compounds are of no practical value. Thus S. and hydrogen form a hydride of S., SiH_4, a colorless and spontaneously inflammable gas, which burns with white flame, giving off clouds of silica. Nitride of S. is a bluish fibrous body, while sulphide of S. is a white earthy powder. S. forms compounds with chlorine, bromine, iodine, and fluorine. S. tetrafluoride, $SiFl_4$, is a colorless pungent gas, liquefiable under strong pressure, and solidifying at −220° F., inflammable., and a non-supporter of combustion. It is formed whenever dry hydrofluoric acid comes in contact with silica, free or combined; and when a stream of this gas is transmitted through water, a reaction takes place; 4 atoms of water and 3 atoms of S. tetrafluoride yielding silicofluoric acid, H_2SiF_6, which remains in solution, and S. hydroxide, $Si(OH)_4$, which is deposited. A saturated solution of this acid forms a very sour fuming liquid, which does not directly attack glass, but if allowed to evaporate on it causes erosion, from the fluoride of S. becoming evaporated, and free hydrofluoric acid being left. A dilute solution is frequently employed in the laboratory as a precipitant of potash, which it throws down in a transparent gelatinous form. With salts of baryta, it gives a white crystalline precipitate. It combines with bases to form salts, none of which are of special importance.

SILIQUA, n. *sĭl'ĭ-kwâ:* a weight of four grains used in weighing gold and precious stones; a carat.

SILIQUE, n. *sĭl'ĭk*, or SILIQUA, n *sĭl'ĭ-kwâ* [F. *silique*—from L. *sil'ĭqua*, a pod or husk]: in botany, the fruit of the *Cruciferæ*, a capsule opening by two valves, which, when ripe, separate from the base upward, leaving a central frame (*replum*), to which the seeds remain attached, and which is regarded as formed by parietal placentas, the valves giving way close to the suture. It is the pod-like fruit of the *Cruciferæ;* as in the cabbage, turnip, and wall-flower seed-pods. The seeds are either in one row or in two. A SILICULE (*silicula*) or SILICLE (q.v.) is merely a S. of different form, the true S. being long and narrow, the silicule broad and short, though Linnæus made this difference the foundation of the orders (*Siliquosa* and *Siliculosa*) of his class *Tetradynamia* a distinction not now equally attended to in the subdivision of the nat. order *Cruciferæ.* SIL'IQUOSE, a. *-ĭ-kwōs*, or SIL'IQUOUS, a. *-kwŭs*, bearing siliques.



Silique.

1, Mustard; 2, Wall-flower; 3, same opened, to show the valves, replum, or dissepiment, and seeds.

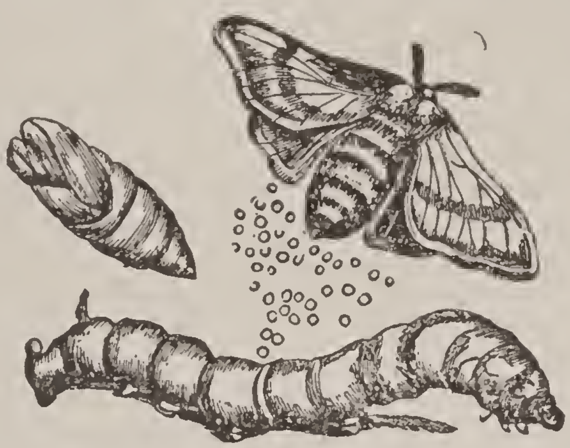
SILIQUIFORM, a. *sĭl-ĭk'wĭ-fawrm* [L. *forma*, shape]: shaped like a silique.

SILISTRIA, *sĭ-lĭs'trĭ-a:* town of the new principality of Bulgaria; on the right bank of the Danube, which is here nearly one-fourth of a mile wide and studded with numerous islands. The houses are mean, and generally of wood, though sometimes of stone, also of mud; the streets, like those of most Moslem cities, are crooked, narrow, dirty, and ill-paved; and the manufactures are insignificant. though there is considerable trade in wood and cattle. The Dobrudscha, ceded by Turkey to Roumania 1878, is bounded by a line running from a point just east of S. to Mangalia on the coast. The importance of S. lay formerly in its value as a military outpost of Turkey. Its walls were of solid masonry; but consisted merely of a fortified *Enceinte* (q.v.) surrounded by a ditch, the great strength of the fortress depending on the support given to it by detached works. S. is a town of great antiquity, and was a fortress under the Byzantines. Here, 971, the Byzantine emperor, John Zimisces, routed the Russians under Sviatoslav. It has been repeatedly assaulted and taken by the Russians. In 1849 S. was made a stronghold of the first class, and was rendered almost impregnable by the addition (1853) of 12 detached forts on the s. and e. On the outbreak of the Crimean war, the Russians laid siege to it, with an army of 60,000 to 80,000 men, but were compelled to retreat after 39 days. The Congress of Berlin, 1878, when erecting Bulgaria into a principality, decreed that the fortifications of S,, like those of the other Bulgarian cities, should be dismantled.—Pop. (1888) 11,414.

SILK, n. *sĭlk* [AS. *seolc;* Dan. *silke,* silk—from L. *sērĭcum,* by a usual substitution of *l* for *r*, the produce of the Seres or Chinese: Gr. *Sēres,* the Chinese]: fine glossy filament or thread produced by certain caterpillars; the thread or cloth made of it (see below): ADJ. pertaining to or consisting of silk. SILKEN, a. *sĭlk'n,* made of silk; resembling silk; dressed in silk; soft; tender. SILK'Y, a. *-ĭ,* possessing the qualities of silk; soft; glossy; having the appearance of silk. SILK'INESS, n. *-ĭ-nĕs,* the state of being silky; softness and smoothness. SILK-COTTON TREE, very large Indian tree whose seed-capsules contain a downy substance like silk (see SILK-COTTON). SILK GOWN, in England, the dress or distinguishing badge of one who has been appointed queen's counsel. SILK'MAN, in *OE.*, a dealer in silks. SILK-MERCER, a dealer in silks. SILK-MILL, a mill for manufacturing silk. SILK THROWER or THROWSTER, one who prepares silk thread for weaving. SILK-WEAVER, one who weaves silk stuffs. SILKWORM, the caterpillar that produces the delicate silk filaments from which silk is manufactured (see SILK). RAW SILK, silk as it is wound off from the cocoons. VEGETABLE SILK (see SILK-COTTON).

SILK: one of the most favorite materials for raiment—product of a worm This insect we will consider first.

The SILKWORM is the caterpillar of the SILKWORM MOTH, of which there are numerous species belonging to the genus *Bombyx* and other genera of family *Bombycidæ*, lepidopterous insects of the section popularly known by the name Moth (q.v.). The *Bombycidæ* have a very short and rudimentary proboscis, living for a very short time in their perfect state, and taking little or no food; the body is thick and hairy; the wings are large and broad, either extended horizontally when at rest, or inclined like the sides of a roof; the antennæ are pectinated. The caterpillars feed on the leaves and other tender parts of trees or other plants; the chrysalids are inclosed in a cocoon of silk, which gives to some of the species great economical importance. The most important is the COMMON SILKWORM (*Bombyx mori*), native of n. provinces of China. The perfect insect is about half an inch in length, the female rather larger than the male; the wings meeting like the sides of a roof; the color whitish, with a broad pale brown bar across the upper wings. The females generally die very soon after they have laid their eggs, and the males do not survive much longer; but some races produce two, and some three, generations. The eggs number 500 or more, about the size of a pin's head, not attached together, but fastened to the surface on which they are laid by a gummy substance, which, when dry, becomes silky. They are laid in the end of summer, and are hatched in the beginning of next summer. The caterpillar is at first very small, not more than a quarter of an inch in length, but rapidly increases in size, till, when full grown, it is nearly three inches long. It is of yellowish-gray color. The head is large. On the upper part of the last joint of the body is a horn-like process. The skin is changed four or five times during the growth of the caterpillar. Before each change of skin, it becomes lethargic, and ceases to eat, whereas at other times it is very voracious. When the skin is ready to be cast off, it bursts at the forepart, and the caterpillar then, by continually writhing its body, without moving from the spot, thrusts the skin backward; but silkworms frequently die during the change of skin. A



Slikworm Moth (*Bombyx mori*) in its various stages.

very rapid increase of size takes place while the new skin is still soft. The natural food of the silkworm is the leaves of the white mulberry, but it will feed on the leaves of some other plants, e.g., the black mulberry and the lettuce. When so fed, however, it produces silk of inferior quality. The silk-producing organs are two large glands (sericteria) containing a viscid substance, which extend along great part of the body, and terminate in two *spinnerets* in the mouth. These glands become very large when the change to the chrysalis or pupa state is about to take place. When about to spin its cocoon, the silkworm ceases to eat, and first produces the loose rough fibre which forms the outer part of the cocoon, and then the more closely disposed and valuable fibre of its interior. In this process, the position of the hinder part of the body is little changed, but the head is moved from one point to another; and the cocoon when finished is much shorter than the body, which, however, being bent, is completely inclosed in it: it is about the size of a pigeon's egg. Each fibre of silk, under a microscope, is seen to be double, being derived equally from the two silk-producing organs of the caterpillar. A single fibre often exceeds 1,100 ft. in length. The time of the silkworm's life in the caterpillar state is generally about 8 weeks. About 3 days are occupied in spinning the cocoon; after which 2-3 weeks elapse before the cocoon bursts and the perfect insect comes forth. The natural bursting of the cocoon is, however, injurious to the silk, and the silkworm rearer prevents it by throwing all the cocoons into boiling water, except those which he intends to keep for maintenance and increase of his stock. These he selects with care, so that he may have about an equal number of male and female insects, the females being known, even in the chrysalis state, by their larger size. The cocoons intended for production of moths are placed on a cloth in a room of which the temperature is near, but does not exceed, 72° F.; the moths make their appearance in 11–15 days, and immediately couple; the females are then placed in a darkened room till they deposit their eggs. It is an interesting peculiarity of this valuable species of moth that neither in the caterpillar nor in the winged state does it show that restless disposition which belongs to many others, the caterpillars remaining contentedly in the trays or boxes in which they are placed, feeding on the leaves with which they are there supplied, and at last only seeking a proper place to assume the chrysalis form on small bundles of twigs which are placed for that purpose above the trays; the perfect moths, in like manner, abiding almost in one spot, and scarcely caring to use their wings. Owing to this peculiarity they are capable of being reared and managed in a way otherwise impossible.

The silkworm is liable to various diseases, particularly to *Silkworm-rot*, or *Muscardine* (q.v.), and *Pebrine*. It is estimated that the latter disease caused in 13 years (1853-66) a loss to Italy and France of about $600,000.000. Pebrine manifests itself by dark spots on the skin of the larvæ: the worms are weak, sickly; the cocoon soft and loose. The disease is hereditary. Pasteur's cure enables the cultivator to stamp out the disease: it consists in examining microscopically the pupæ, and rejecting and destroying all generations in which diseased chrysalids are found; the moths, too, before coupling are examined microscopically.

Of the other species of silkworm, many are rapidly increasing in commercial importance. The following is an enumeration of the chief silk-producing insects; those in Italics are not as yet employed in manufactures:

Bombyx mori.—The common silkworm, native of India, and reared in other parts of the world.
B. cræsi.—Crosses have been obtained between this and B. mori, yielding excellent silk, at Mussooree.
B. textor.—Native of Mussooree.
B. sinensis.—China.
B. Huttoni.—Silk collected in Mussooree.
B. Horsfieldi.—Native of Java.
Attacus atlas.—Native of India, and said to yield some of the 'Tussah Silk.'
A. Guerini.—Native of Bengal.
A. ricini.—Native of Assam.
A. cynthia.—The 'Eria' or 'Arrindy' silkworm, native of India, extensively raised in Hong-Kong, Japan, Nepaul, Mussooree, Java, and to some extent in southern Europe. It feeds on the leaves of the Ailanto (q.v.) tree: in Japan a large product is now obtained from caterpillars fed on these leaves, and the silk is cheaper and the fibre more durable than the mulberry-silk, though not so fine and with less gloss.
Antheræa Mezankooria.—The Mezankooria silk-moth.
A. Paphia.—The true Tussah or Tussur Moth, native of Darjeeling and other parts of Upper India. It is produced very extensively, and is collected chiefly in the jungle districts by the Sahars and other half-wild castes who live in the jungles. The cocoons are so carefully concealed in the leaves that much care is required to discover them, the only indication being the dung of the caterpillar under the trees. The tussah silk is easily wound off from the cocoons in the same way as that of the common silkworm.
A. Assama.—The Moonga, or Moogha, native of Assam.
A. Pernyi.—North China.
A. Perrottetti.—North China.
A. Roylei.—Mussooree.
A. Helferi.—Darjeeling.
A. Jana.—Java.
A. Frithii.—Darjeeling.
A. Larissa.—Java.

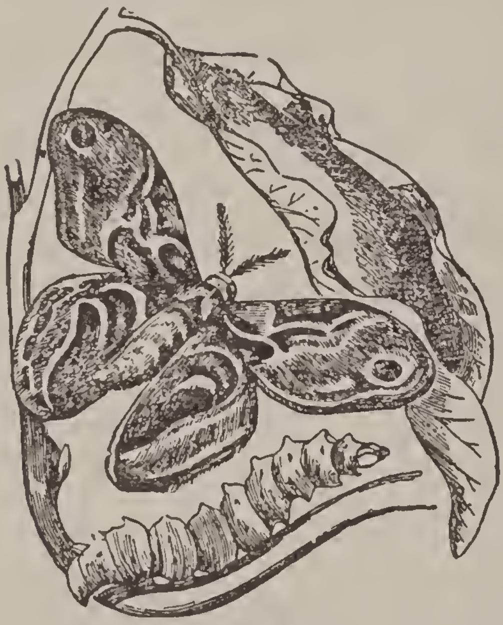
The preceding seven are called Tussah moths.

Actias Selene.—Darjeeling.
Saturnia pyretorum.—China.
S. Grotei.—Darjeeling.
Lœpa Katinka.—Java.
Neoris Huttoni.—Mussooree.
Caligula Tibeta.—Mussooree.

C. Simla.
Salassa Lola.—Southeast Himalaya.
Cricula triferrestrata.—Java.

It will be seen by the above list that hitherto very few of the silk-moths have been turned to man's profit. The first in importance after the common silkworm is the true *Tussah*, next the *Moonga*, the silk from both of which can be wound off the cocoon; and then the *Eria*, which cannot be wound easily, and is therefore generally carded.

In 1890 the silk section of the U. S. dept. of agriculture distributed in 42 states and territories 800 oz. of eggs, which comprised the following varieties: French: Deydier (Cevennes race); Ribaud l'Ange and Gorde (Lower Alps race); Aubin (improved Var race); and Forné (Pyrenees race); Italian; Mercolini (Marches race); Pucci (Umbrian race); and Mari (Ascoli race, varieties B. and P.). The best average crop per quarter oz. was the Pyrenees, 13 lbs. 2 oz.; and the largest crop per quarter oz. was the Alps, 35 lbs. 8 oz., with the Pyrenees second, 35 lbs. 4 oz. The eggs were divided into 2,250 lots, of which 306 lots went to Kan., 211 to Mo., 177 to O., 166 to Ill., 154 to Penn., and 123 to Va.



Ailanto Silkworm (reduced), showing the Cocoon of Silk attached to a Leaf.

Silk appears not to have been well known to the ancients: though several times mentioned in translations of the Bible, the best authorities deny that it is in the original, or that it was known to the Hebrews. Among the Greeks, Aristotle is the first who mentions it, and he says only that 'Pamphile, daughter of Plates, is reported to have first woven it in Cos;' and from all the evidence, it appears that the natives of Cos received it indirectly (through the Phœnicians and Persians) from China. The silken webs of Cos found their way to Rome, but it was very long before they were obtainable, except by the most wealthy. The cultivation in Europe of the worm itself did not take place until A.D. 530, when, according to an account by Procopius, the eggs were brought from India (China) to Emperor Justinian by some monks.

In China the cultivation of silk is of the highest antiquity; and according to the greatest Chinese authorities, it was begun by Si-ling, wife of Emperor Hoang-ti, B.C. 2600, and the mulberry was cultivated for the purpose of feeding the silkworm only 40 years later.

Since its introduction to Europe, it has always formed a great branch of industry in Italy, Turkey, and Greece, and it has been cultivated to some extent in France, Spain, and Portugal. In England and the United States, efforts have been made to cultivate it; though in England the climate is not sufficiently warm and is too variable, and in neither of those countries is labor sufficiently cheap. Nevertheless the United States 1890 produced 16,953 lbs., 15 oz. of fresh cocoons—Kan. yielding 3,738 lbs., Mo. 3,161, O. 1,701, Ill. 1,026, and Utah 890. Recently, silk has been successfully cultivated in New Zealand.

The quantity of silk raised in the world is enormous. The total amount available for European and American consumption 1884–5 was: in Italy 6,500,000 lbs.; China 5,000,000; Japan 2,000,000; Greece and Asia Minor 1,200,000; France 1,000,000; Canton 700,000; Bengal 300,000; Spain 150,000—total 16,850,000. An official estimate of silk manufactures 1883 gave France $85,000,000; Germany $45,000,000; United States $35,000,000; Great Britain $25,000,000; Switzerland $18,000.000; Russia $16,000,000; Austria $12,000,000; Italy $12,000,000; Spain $5,000,000; all other countries $17,000,000—total $270,000,000.—The total imports into the United States in year ending 1890, June 30, were: non-dutiable—cocoons 162,531 lbs., value $88,522; raw silk 5,943,360 lbs., value $23,285,099; waste 1,404,549 lbs., value $951,910; and silkworm eggs to the value of $6,336—total value $24,331,867: dutiable—dress and piece goods $10,975,087; ready-made clothing and other wearing apparel $595,344; laces $3,804,374; ribbons $1,968,486; all other manufactured silk articles $21,343,083—total $38,686,374: grand total $63,018,241. The total value of S. manufactures in the United States 1890 was $60,000,000, and the imports of S. manufactures in year ending 1891, June 30, aggregated $37,880,857. In 1901 the cap. invested was $74,759,347; value of products $103,859,568; value of unmanufactured silk imported 1902-3, $50,011,819; of silk manufactures exported, $412,415. During 1870-90 the importations of raw silk increased from 583,589 lbs. (value $3,017,958) to 5,943,360 lbs. ($23,285,099), or more than 900 per cent. in weight and 670 per cent. in value. The imports of raw silk into the United Kingdom 1887 were valued at $10,200,000; and of manufactured articles 1901 at $65,203,414. In 1889 France exported manufactured articles to the value of $48,249,832, of which $22,039,661 went to England, $13,860,438 to the United States, $3,859,420 to Ger. It requires 1,600 worms to raise a pound of silk.

Rearing of Silkworms.—It is of the first consequence in production of silk that one of the species of mulberry should be cultivated, and that it should be so favorably situated as to climate that its foliage is in readiness for feeding the young worms when they are first hatched from the eggs. The species best adapted is the white mulberry, *Morus alba*, but the black mulberry and other species are hardly inferior. It is said that in parts of China the silkworm is easily reared on the trees in the open air So little has it a tendency to wander far from the place of its birth, if food be at hand, that it requires only a warm dry atmosphere to bring it to perfection, but usually, even in China, and in all other countries, it is thought desirable to raise the silkworm in properly arranged buildings, and to supply it with mulberry leaves gathered from day to day. In India, China, and other tropical countries, the eggs hatch readily at the proper time by the natural heat; but in s. Europe artificial heat is almost always required; formerly, the heat of fermenting dung was found serviceable, and the warmth of the human body was also used, the eggs being carried in little bags in the bosom of the cultivators; but now they are regularly hatched by stove-heat, beginning with a temperature of 66° F., which is gradually increased through ten days to 78°, at which it is maintained until the eggs are hatched. Experience has shown that the operation is facilitated by first washing the eggs with clean water; and some cultivators wash them in wine also, the advantage of which is questionable. Washing is found to remove a certain gumminess and other impurities from the eggs, which would otherwise impede the hatching. When the silkworms have been regularly developed as above described, it is usual to place above the trays various little contrivances for the caterpillar to spin within: many of the Italian growers employ an ingeniously simple arrangement, which lasts many seasons, and when not in use, occupies very small space. It consists of a number of thin slips of wood, about an inch and a half broad, and all cut sufficiently long to reach across the trays. They are each cut at intervals of an inch half through as in fig. 1, so that one will fit into another, as in fig. 2; and when complete, they all form a series of cells, which, set in a tray (fig. 3), form the very best receptacles for the silkworm to spin in. When not in use, the whole arrangement, can be compressed into very small compass, as in fig. 4, for convenience of storage. Others use little cones of paper, or small twigs, among which the cocoons are spun.

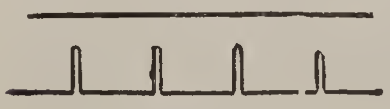


Fig. 1.

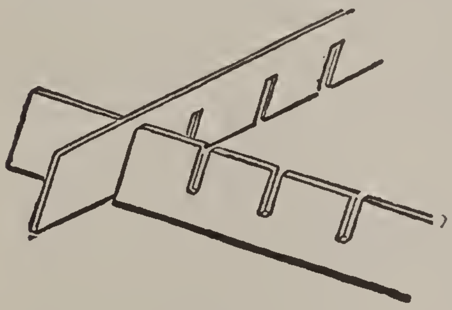


Fig. 2.

In feeding the worms, care is taken so to distribute the food on the shelves or in the trays that the insects shall not crowd together; and for this reason, the most careful cultivators chop the leaves small, and strew them very evenly about. Great care is taken not to let the worms of one hatch mix with those of another, unless of exactly the same age, otherwise the stronger insects would deprive the younger of their food. Many other niceties of attention are required, which altogether render the successful rearing of silkworms a matter of anxiety and labor.

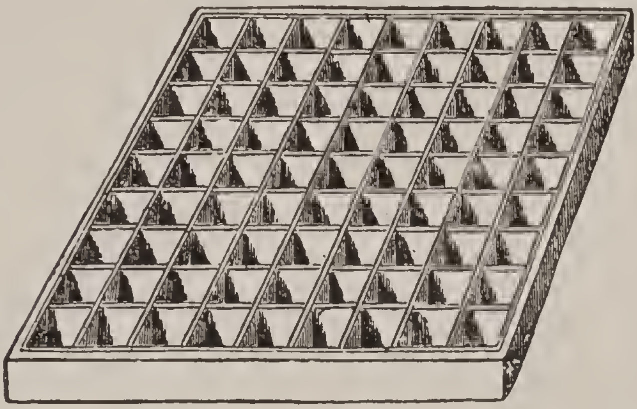


Fig. 3.

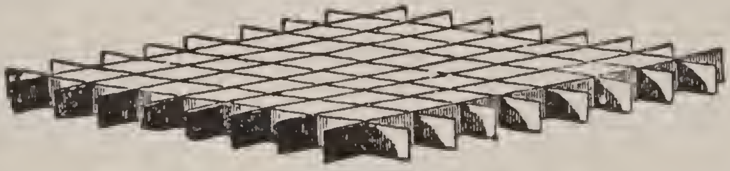


Fig. 4.

Silk: *its Preparation.*—When the cocoons are completed, which is known by the absence of any sound within, they are carefully sorted, and a certain number are kept for laying. The sexes are readily known by difference of shape as well as of size, the female being plumper, as in fig. 5; and the male (fig. 6), besides being much smaller, having a central depression and sharper extremities. The French growers sort them into nine varieties, those which are less compact, or in which the worm has died—a fact known by external indications—being separated from the good ones. When the sorting is finished, the cocoons are placed in an oven with gentle heat, which kills the inclosed chrysalis, otherwise they would all become *perforated* by the insect eating through; they are then prepared for winding by first removing the flossy covering, which is often somewhat hard and compact. The cocoons are placed in basins of water, kept warm by charcoal fires, or, in the larger establishments, by steam. This softens and dissolves the natural gum which coats the silk, and makes the various coils of silk adhere together in the cocoon. The operator then takes a small branchy twig, and stirs them about in the water. This is sure to catch hold of any liber-

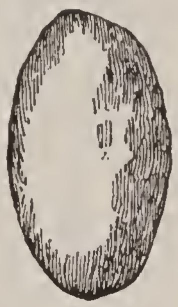


Fig. 5.

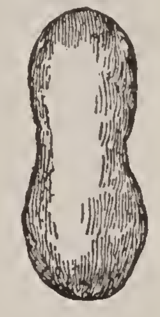


Fig. 6.

ated ends which may be floating in the water. From three to five of these ends are taken and twisted together with the fingers, so as to unite them into one thread, and this is passed through a polished metal or glass eye in the reeling-machine, which is so far from the hot-water basin as to give the softened gum on the silk time to dry in its passage from the basin to the reel. In large *filatures* or silk establishments, complex machinery is used for winding; but reeling apparatus of the greatest simplicity is used by the Chinese, E. Indians, and others with almost equal effect when carefully done, except in the amount of work accomplished. In all cases, however, the principle is the same, and is very simple, as shown in fig. 7, in which *a* shows the small pan of warm water holding the cocoons,

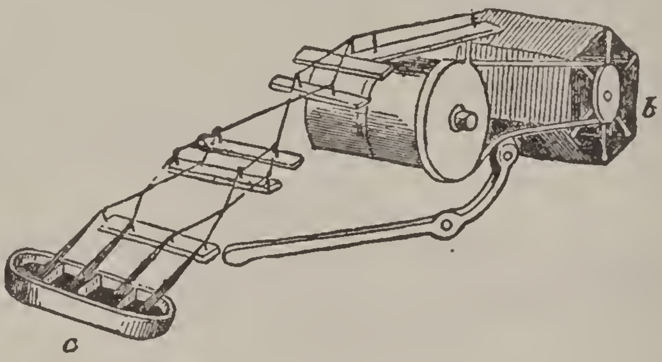


Fig. 7.

the threads from which are gradually united, and wound on the reel *b*. Great care and skill are required in reeling silk from the cocoons, because, though the reeler starts with four or five cocoons, not only are their individual threads apt to break, but they are not all of the same length, so that one will run out before the others. These matters are carefully watched; and as often as a thread breaks, or a cocoon runs out, another thread is joined on, and is made to adhere to the compound thread on the reel by its natural gumminess. Each cocoon generally yields 300 yards of thread, so that it takes 1,200 or 1,300 yards to make 300 yards of the filament of *raw silk*, by which name the reeled silk is always known. The raw silk is made up into hanks of various sizes. That from China and Japan is tied in packages of six hanks each, technically called *books;* and sometimes the ends of these books are covered with silken caps very curiously formed out of a single cocoon, so managed as to form a filmy cap sufficiently large to cover a man's head. The method by which the Chinese accomplish this is unknown in Europe. These caps or bags, when closed, are sometimes nearly a foot square, and much of the wadding used by the Chinese dressmakers for padding is made by placing these bags upon each other to the required thickness.

Notwithstanding the care taken in reeling the silk from the cocoons, and forming several threads into one, it is not ready for the weaver, but has to undergo the processes called collectively *throwing*. This is a special trade, the *silk throwster* usually conducting it in large mills with extensive machinery, where the above processes all are carried on, usually by steam-power. The silk reaches the throwster in hanks as imported. These are put into clean soap and water, and carefully washed, ties having been placed at intervals, to prevent the silk entangling. After being dried by hanging in the drying-room, they are placed on large skeleton reels called *swifts* (fig. 8), so adjusted that they will hold the hanks tightly. Fig. 9 is a front view of a *swift*, and shows that the spokes *a*, *a*, are in pairs. They are made of thin pieces of lance-wood, and each pair are rather nearer together at the axle than at the circumference, where they are connected together by a small band of cord *b*. These bands are so tied that they will slip down easily to admit of the hanks being placed; then, by pushing the cords upward, the hank can be stretched to its fullest extent. This is necessary to compensate for the varying lengths of the hanks received from different countries.

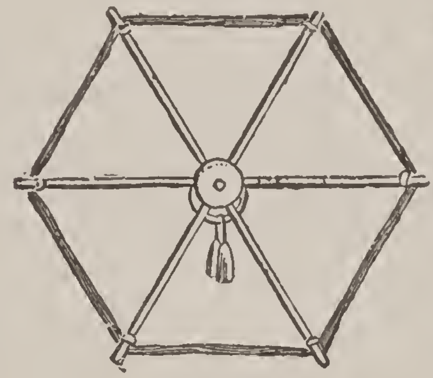


Fig. 8.

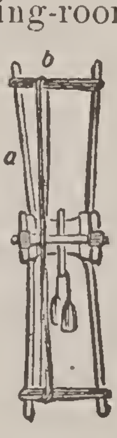


Fig. 9.

When the *swifts* are set in motion, the silk is carried from the hanks to bobbins, upon which it is wound for convenience of further operations. The bobbins are then taken from the *winding* to the *cleaning* machine, when they are placed on fixed spindles, so that they will turn with the slightest pull; and the thread is passed through a small apparatus attached to the machine, which is specially called the cleaner, and consists essentially of two polished smooth-edged blades of metal (*a*, *a*, fig. 10), attached to a part of the frame of the machine, *b*. They are held together by the screw *c*, and are slightly opened or closed by the other screw, *d*, so that the thread can be put between them down to the small orifice, *e*, and then, by tightening the screw, preventing its return, after passing through this small hole, which is the gauge of the thread, and which removes any irregularities or adherent dirt. The silk next passes over a glass or metal rod, and then through another small hole, much larger than that of the *cleaner*, and usually made in glass, on to the bobbin, upon which it is wound by action of the machine. The next process is *twisting* the cleaned thread, by which it becomes better adapted for being combined with other threads.

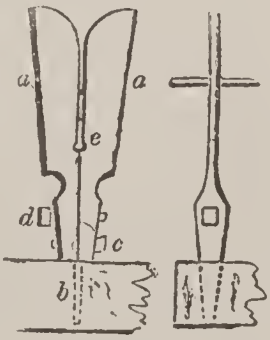


Fig. 10.

Doubling is the next process, and this consists in running off a number of bobbins of *twisted* silk on to one bobbin of a larger size, which is put into the *throwing* machine, when the ends of the *doubled* silk are passed through a smooth hole on to a large reel, which rewinds it into hanks, but twisting the threads into fine cord as it goes from the bobbins to the reel. This operation of *throwing* derives its name from the Saxon *thrawan*, to whirl or twist. After this, the hanks have to be again wound on reels and bobbins for the weaver, the former for the warp, the latter for the weft. For many purposes, only some of these operations are required. Thus for common and light fabrics, such as *Persian, gauze,* etc., only the two first are needed—viz., *winding* and *cleaning*, and the material is called *dumb-singles.* If it has been *wound, cleaned,* and *thrown,* it is called *thrown-singles,* and is used for weaving common broad stuffs, or plain silks and ribbons. If *wound, cleaned, doubled.* and *thrown*, it is called *tram,* and is used for richer silks and velvets, but only for the weft or shoot; and if *wound, cleaned, spun, doubled.* and *thrown*, it is called *organzine,* and is used for warps of fine fabrics.

Before winding the cocoons, a flossy portion has to be removed; and after all has been wound off, another portion remains, like a compact bag; these are collected and sold under the name *waste-silk,* and to these are added the fragments of broken threads, which accumulate in considerable quantities during the reeling and throwing operations. Formerly, little use was made of waste-silk; some of it was employed by engineers and others for mere cleaning purposes; though, as early as 1671, a proposition was made by an English manufacturer named Edmond Blood to make it available by carding it with teasels or rowing-cards—for which invention he took out a patent, but apparently did not bring it into use. Under a later patent the waste (i.e., remains of cocoons after reeling, floss or outer fibres of cocoons, and waste from the rowing processes) is all spun into yarn, thereby greatly economizing the use of silk, as the quantity of silk-waste always greatly exceeds the amount of good silk reeled off. Processes employed in production of silk yarn from the waste differ little from those for spinning other materials. See SPINNING.

The principal silk-manufacturing centres in the United States are Paterson and Hoboken, N. J., Brooklyn, and New York, for manufactures of reeled silk; and S. Manchester and Hartford, Conn., for manufactures of spun silk. The manufactures of Britain are chiefly in Spitalfields, London, at Macclesfield and Congleton in Cheshire, at Derby, and in Glasgow.

SILK-COTTON: various silky fibres brought from tropical countries to Europe and the United States; all of the same general character, and produced by the trees composing the genus *Bombax* and other genera recently separated from *Bombax*, of nat.order *Sterculiaceæ*, known as S.-C. trees. These trees are natives of tropical Asia, Africa, and America. The fibre fills their large woody capsules, enveloping the seeds, and is produced in great abundance; but is too short, too smooth, and too elastic to be spun by the machinery used for cotton, though attempts have been successfully made on a small scale in India to spin and weave it; and the fibre of *Bombax villosum*, of beautiful purple color, is woven into cloth and made into articles of dress in New Spain. S.-C. is much used for stuffing pillows, mattresses, and sofas: it has the fault, however, of being easily broken and reduced to powder. It might probably be very useful in manufacture of gun-cotton and collodion. The S.-C. of the E. Indies is imported into western lands under the name of *Moc-main.*—*Bombax ceiba,* the common S.-C. tree of the W. Indies and S. America, attains a very great size—its trunk sometimes being so thick that it could not be encompassed by the outstretched arms of 16 men, and canoes are hollowed out of it of an average burden of 25 tons. The wood is soft and spongy, but is used for many purposes, and when cut into planks, and saturated with lime-water, it bears exposure to the weather many years.—*Bombax Malabaricum,* or *Salmalia Malabarica,* is the common S.-C. tree of the E. Indies: it is a tall tree, covered with formidable thorns. Although it is a tropical tree, its leaves fall annually; and just before the fresh leaves appear, it is covered with crimson tulip-like flowers, so abundant that, 'when they fall the ground for many roods on all sides is a carpet of scarlet.'

The fibre of the capsules of *Chorisia speciosa* and *C. Pecholtiana* trees, nearly allied to the genus *Bombax,* and natives of Brazil, is known as VEGETABLE SILK. It has a beautiful satiny lustre, and is very light, but no mode of spinning and weaving it has yet been invented.

SILK'-WEED, or MILK'-WEED: see ASCLEPIADACEÆ: ASCLEPIAS.

SILK'WORM GUT: material used by anglers for dressing the hook-end of the fishing-line; prepared from the silkworm at the period when it is just about to spin, and the sericteria or silk-vessels are distended with the secretion. The worms are immersed 12 or 14 hours in strong vinegar, and then taken separately, and pulled in two very gently. The skilled operator knows at sight if the soaking in vinegar has been sufficient, and if so, he lays hold of one end of the viscid secretion, which is seen in the silk glands, and attaches it to the edge of a board; the other end he stretches to the other edge of the board, and attaches it with a pin. When a number are drawn across the board, it is set in the sun for the threads to dry, when they are tied into bundles for use. They are produced chiefly in Italy and Spain.

SILL, n. *sĭl* [Low Ger. *sull;* Ger. *schwelle*, a threshold: Sw. *syll;* Dan. *syld*, base of a framework, ground-sill: AS. *syl*, a base, support: Gael. *sail*, a beam of wood]: any basis of stone or wood on which a structure rests; the timber or stone forming the bottom of a door or window; the threshold of a door or window; wooden plate along the bottom of a partition: in *mining*, flat-bedded strata of sandstone or similar hard rocks; in *fort.*, the inner edge of an embrasure.

SILLABUB, or SYLLABUB, n. *sĭl'lă-bŭb* [a corruption of Eng. *slap-up* or *slub-up:* Low Ger. *slabb'ut;* Swiss *schlabutz*, watery food]: a frothy food prepared by stirring up briskly, or by whipping up, a mixture of cream and wine, cider, or spirits, with spice, etc.—sometimes by milking from the cow into wine, etc.

SILLADAR HORSE, *sĭl'lă-dâr* [Hind. *silah*, arms, accouterments]: Indian irregular cavalry, in which every horseman maintains and equips himself and horse for a certain amount of pay—more correctly SILAHDAR; vernacularly, SILEDAR.

SILLER, n. *sĭl'lėr* [a corruption of SILVER]: in *Scot.* and *prov. Eng.*, silver; money in general.

SILLERY, n. *sĭl'ėr-ĭ:* a non-sparkling champagne wine, so called after the Marquis of S., owner of the vineyards where it is produced.

SILLIMAN, *sĭl'ĭ-man*, BENJAMIN, M.D., LL.D.: physicist· 1779, Aug. 8—1864, Nov. 24; b. N. Stratford (now Trumbull), Conn.; son of GOLD SELLECK S., who won high distinction as col. and brig.gen. in the war of the revolution. Having graduated at Yale Coll. 1796, he first taught school, then began the study of law, and was admitted to the bar 1802. But in Sep. of that year he was chosen prof. of chemistry and natural history in Yale, and abandoned the profession of law. Before taking his professorial chair he for two winters studied chemistry in the Univ. of Penn., and spent a year in Edinburgh, London, and on the continent of Europe, collecting scientific works and apparatus, and making the acquaintance of eminent men of science. At Edinburgh geology engaged most of his attention. On his return home he applied himself to a mineralogical and geological study of the vicinity of New Haven, and thus laid the foundation of Yale's world-wide fame for research in natural history. One of his first scientific monographs was his account of the meteorite that fell in Weston, Conn., 1807, Dec. 14: it was the first scientific account of the kind in this country, and was read before the Royal Soc., London, and the French Academy. He was the first, with the aid of the oxyhydrogen blow-pipe, to reduce many of the most refractory minerals; he also first observed the vaporization and transference of the carbon in the voltaic arc from the positive pole to the negative (1822). He explored the coal-formations of the Wyoming valley, Penn., 1830, and the gold mines of Va. 1836; meanwhile he had, under govt. auspices, made a scientific examination of the culture and manufacture of sugar. Not less important than his original researches for advancement of science in America, were his courses of public lectures on chemistry and geology, delivered in Hartford, Conn., in Lowell, Salem, and Boston, Mass., in New York, Baltimore, Washington, St. Louis, New Orleans, and other cities. These lectures attracted great audiences. He founded the *Amer. Jour. of Science and Arts* 1818. He edited Wm. Henry's *Elements of Chemistry* (1808) and Bakewell's *Geology* (1829). He was author of *Journals of Travels* (1810); *A Short Tour* (1820); *Elements of Chemistry* (1830); *Geology and Sacred History* (1837); *Visit to Europe* (1853). S. was the first pres. of the Amer. Assoc. of Geologists and Naturalists, later known as the Amer. Assoc. for the Advancement of Science. He was a genial and courtly man, and endeared himself to many graduating classes and to a wide circle of friends.

SILLIMAN, *sĭl'ĭ-man*, BENJAMIN, Jr., M.D., LL.D., chemist: 1816, Dec. 4—1885, Jan. 14; b. New Haven, Conn. He graduated at Yale 1837, and until 1846 was asst. instructor in chemistry, mineralogy, and geology there. In 1846 he became prof. of applied chemistry, and 1854 succeeded his father as prof. of chemistry, holding the position until 1870, and was in the med. dept. until his death. In 1838 he became associate editor of Silliman's *Journal of Science*, and afterward with J. D. Dana associate proprietor. In 1847 he and Prof. John D. Norton founded the Yale Scientific School, since become the Sheffield Scientific School. 1849–54 he was prof. of medical chemistry and toxicology in the Univ. of Louisville, Ky. He gave a course of lectures on agric. chemistry in New Orleans 1845–6, at request of the citizens. He lectured on scientific subjects in most of the large cities, and was for many years sec. of the Amer. Assoc. for the Advancement of Science, and member of many other scientific societies. Prof. S. was author of *First Principles of Chemistry* (1846–56); *Principles of Physics* (1858–68); and *American Contributions to Chemistry* (1875). He died at New Haven.

SILLON, n. *sĭl'on* [F.]: in *fort.*, a work raised in a ditch to defend it, if too wide. It must be lower than the main works, but higher than the covered way.

SILLOTH, *sĭl'loth:* town and watering-place of England, of quite recent origin, in the county of Cumberland, at the terminus of a branch of the North British railway, 20 m. w.n.w. of Carlisle; picturesquely situated on the Solway. The port is of growing importance, and has a good stone dock, with a fine jetty, 1,000 ft. long. An important new dock, made by the railway company at a cost of £90,000, was opened 1885. S., which commands a fine view, is much resorted to for sea-bathing, the climate being mild and salubrious, and considered highly favorable for those affected with pulmonary ailments. The mean annual temperature is 49°, being the same as that of Worthing (q.v.) on the s. coast of England, and only 1° below that of Torquay. S. is of easy access from all parts of England by railway; and steamers ply at stated intervals to and from Liverpool and other places. Pop (1890) 2,600.

SILLOWAY, *sĭl′lo-wā*, THOMAS WILLIAM: architect: b. Newburyport, Mass., 1828, Aug. 7. After receiving a thorough education in the arts of design, he opened an office in Boston, 1851, since which time he has prepared plans for the construction or alteration of about 300 church and other public buildings, including the Montpelier, Vt., capitol. After preaching for some years, he was ordained as a Universalist 1862. Among his publications are several works on building and church music, and with L. L. Powers he published *Cathedral Towns of England, Ireland, and Scotland* (1883).

SILLY, a. *sĭl′lĭ* [AS. *sælig;* Ger. *selig*, blessed, happy—constantly used by older writers in the sense of 'simple,' 'unknowing': Goth. *sels*, good, kind]: weak in intellect; simple; proceeding from want of understanding or judgment; imprudent; indiscreet; in *OE.*, weak; helpless; frail; rustic; rude. SIL′LILY, ad. *-lĭ-lĭ.* SIL′LINESS, n. *-nĕs*, weakness of understanding; want of sound sense or judgment.—SYN. of 'silly': witless; shallow; foolish; simple; brainless; unwise; indiscreet; imprudent; harmless; innocent; inoffensive.

SILO, n. *sī′lō* [L. *sirus*, Gr. *siros*, a pit for keeping corn in]: close pit, or construction, for storing grass and other fodder, which is then called *Ensilage* (q.v.).

SILOAM, *sĭ-lō′am*, or SILOAH, *sĭ-lō′ah*, or SHILOAH, *shĭ-lō′ah* [Heb. *Siloah*, probably meaning 'sent']: pool or tank in Jerusalem, on the s. slope of that part of the temple-hill called Ophel, about 1,200 ft. s.s.w. of the 'fountain of the Virgin,' and connected with it by a winding underground passage. It is not, as is popularly supposed, a natural spring or fountain, but an artificial reservoir, one of the many sources of water-supply for the ancient city. It is oblong in form, and according to Dr. Barclay, who gives the most exact measurements, it is 50 ft. long, 14½ ft. wide at its lower or e. end, 17 ft. wide at the upper end, and 18½ ft. deep, but is now never filled, the water being usually three or four ft. deep. It was anciently arched over. Though the smallest of all the pools of Jerusalem, it is the most famous. It is mentioned three times in the Bible—Is. viii. 6; Neh. iii. 15; Jn. ix. 7. Josephus speaks of it.

East of the Kedron, on the site of an old quarry, and on a slope overlooking the pool, from which it takes its name, is a miserable, dirty little village of uncertain antiquity. Some comparatively recent discoveries seem to connect the Zoheleth of I Kings i. 9, with a stone plateau near the centre of the village, whose w. perpendicular side overhangs the valley. From its locality, it is thought to be the place where stood the idol-shrines built by Solomon to Chemosh, Ashtoreth, and Milcom.

SILOMETER, n. *sī-lŏm'ĕ-tėr* [first element doubtful, Diez derives it from Scand. *sila*, to plow, and Littré from F. *siller*, to make sail; Gr. *metron*, measure]: instrument of various forms for measuring, without the aid of the log-line, the distance passed over by a ship. Various forms have been proposed or actually constructed.

SILPHIUM, *sĭl'fĭ-ŭm* [from a Gr. word referring to some plant that produced resinous gum]: genus of plants, known as rosin-plants, of family *Compositæ*. The flowers have fertile rays and sterile disk florets, on a chaffy receptacle; the color is yellow; and the herbs are tall, coarse, perennial, with resinous juice.—ROSIN-WEED or COMPASS-PLANT (*S. laciniatum*), 3–6 ft. high, has pinnately parted and slashed leaves, that, on the prairies, are disposed to turn their edges n. and s.; hence the name.—Prarie Dock (*S terebinthinaceum*) is smooth, slender 4–10 ft. high, with leaves 1–2 ft. long, and has a pinnatifid variety with deeply cut leaves.—Three other w. species, *S. trifoliatum*, *S. integrifolium*, and the Cup-plant, *S. perfoliatum*, are described in their names, the last having a square stem and connate-perfoliate leaves. A southern species, *S astericus*, is unlike *S. trifoliatum* in having less narrow leaves, coarsely toothed and hairy, and large flower-heads almost solitary.

SILT, n. *sĭlt* [from the obsolete Eng. verb *sile*, to ooze through, to sink down: Sw. *sila*, to strain, to filter: Low Ger. *silen*, to drain off water: Gael. *sile*, to filter (see SILE)]: properly, the fine mud which collects in lakes and estuaries, but now used to designate any gradual deposit of mud, clay, or sand: V. to become choked or obstructed with mud, sand, or other deposit; to percolate; to ooze. SILT'ING, imp.: N. the process by which a harbor, inlet, or estuary becomes choked or obstructed by the deposition of mud or sand, etc. SILT'ED, pp. TO SILT UP, to obstruct or choke up by an accumulation of fine mud.

SILURE, n. *sĭ-lôr'*, or SILURUS, n. *sĭ-lô'rŭs* [L. *silūrus*; Gr. *silouros*]: large fresh-water fish; a shad.

SILURES, *sĭ-lū'rēz* or *sĭl'ū-rēz*: ancient Brit. people on the border between England and Wales, who, under their king Caractacus, long withstood the Romans.

SILU'RIAN ROCKS: large division of the Paleozoic rocks between the Archæan and Devonian strata. The term 'Silurian' was introduced by Sir R. I. Murchison, and is derived from the district where he investigated the strata; S. Wales having of old been occupied by a people known to the Romans as Silures.

The Silurian system contains an enormous thickness of rocks—nearly 30,000 ft., according to some estimates; but Archibald Geikie's estimate of average thickness is 18,550 ft.: the absolute thickness is greatly increased by immense beds of interstratified igneous rocks. The upper limit, underlying the Old Red Sandstone, is universally accepted, but there has been diversity of opinion as to the inferior boundary. Prof. Sedgwick, having described the rocks of N. Wales, at first considered older than the series which Murchison had illustrated, designated them Cambrian. This name has been retained for the immense mass of indurated shales and sandstones of a thickness greater even than that of the Silurians, which contain only faint traces of organic life, and underlie the Llandeilo formation. But Sedgwick claims also the Lower S. R. as a portion of his system; the priority of name, and the uniform facies of the organic remains of the whole of the S. R., have, however, induced geologists to consider the limits of the system to be those originally given by Murchison.

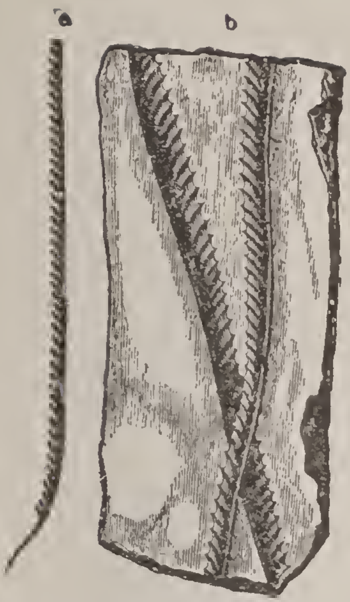
The subdivisions of the rocks of the period are the following:

UPPER SILURIAN ROCKS.	Thickness in Feet.
Upper Ludlow—	
1. Downton Sandstone and Tilestones	80 to 1,000
2. Upper Ludlow Shale	800
Lower Ludlow—	
3. Aymestry Limestone	150
4. Lower Ludlow Shale	900
Upper Wenlock—	
5. Wenlock Limestone	300
Lower Wenlock—	
6. Wenlock Shale	1,400
7. Woolhope Limestone and Denbighshire Grit	150
MIDDLE SILURIAN ROCKS.	
Upper Llandovery—	
8. Tarannon Shale	1,000
9. May-hill Sandstone and Pentamerus Limestone,	800
Lower Llandovery—	
10. Llandovery Slates	1,000
LOWER SILURIAN ROCKS.	
Caradoc—	
11. Caradoc Sandstone	12,000
12. Bala Limestone.	
Llandeilo—	
13. Upper Llandeilo	1,500
14. Lower Llandeilo or Arenig Beds	
Contemporaneous Volcanic Rocks	5,800

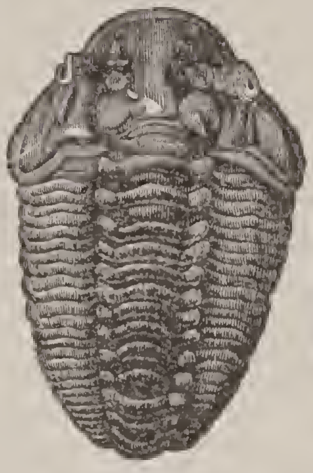
The typical Silurian strata are in Wales and the adjoining English county, Shropshire. Except the s. and s.e. districts, where the Old Red Sandstone and Coal-measures occur, the whole of Wales is composed of Silurian and Cambrian rocks. The same deposits are found in Cumberland and n. Lancashire. The whole of Scotland s of a

PLATE 8.

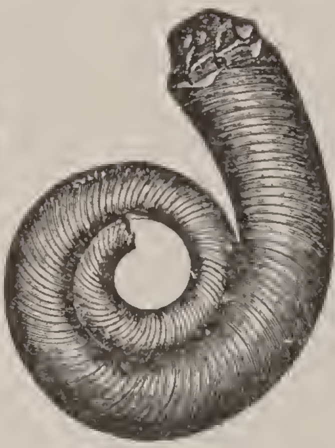
Silurian Formations



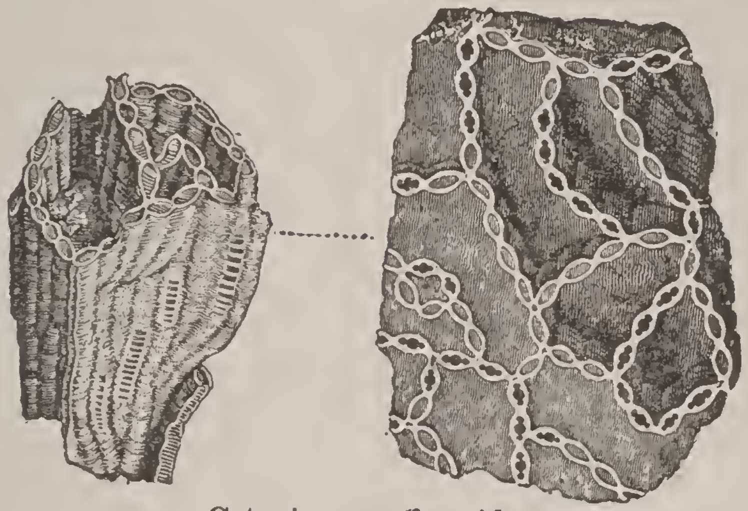
a. Graptolithus Beckii.
b. Graptolithus latus.



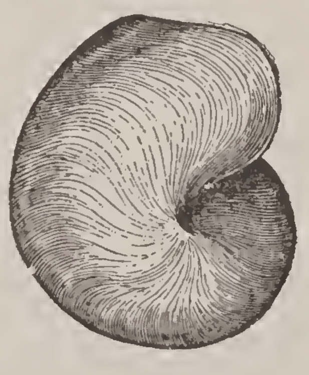
Calymene Blumenbachii.



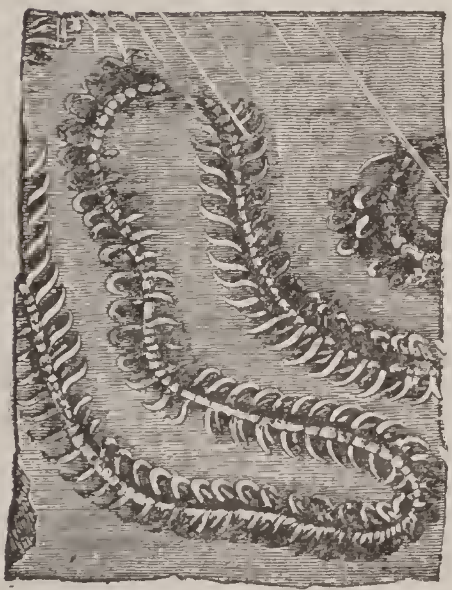
Lituites cornu arietis.



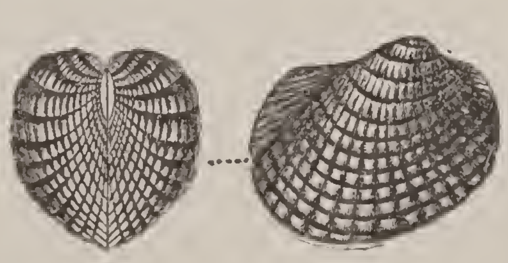
Catenipora escharoides.



Bellerophon bilobatus.



Nereites cambrensis.



Cardiola interrupta.

line from Dunbar on the e. to Girvan on the w. consists of graywacke rocks, slates, and limestones of Silurian age, except one or two small patches of Old Red, Carboniferous, and Permian strata. The rocks, till recently referred to an azoic group, below the lowest fossiliferous strata in n. Scotland, are now generally believed to be highly altered beds of this period. The s. boundary of these beds is a line drawn from Stonehaven to Helensburgh. A huge trough, filled with Old Red Sandstone and Carboniferous strata, separates the highly altered strata of the n. from the less altered deposits of the s. An extensive region of S. R. occurs in the s.e. counties of Ireland and in Galway; and a great tract of the same beds extends from the centre of Ireland (Cavan, etc.) to the coast of Down.

On the continent of Europe, Silurian strata have been examined and co-related with the British types: in Bohemia, by Barrande; in Scandinavia, by Angelin; in Russia, by Murchison and others. In Germany there are a few detached areas of S. R., seen in the Thüringer Wald (1,600–2,000 ft. of fucoidal schists representing apparently the Lower Silurian) and in the Harzgebirge. The S. R. are represented also in n.w. France and in w. Spain; similar strata are found in India, Australia, and S. America. In the N. Amer. continent the S. R. extend continuously over a very wide territory—viz., from the mouth of the St. Lawrence s. into Ala. and w. to the head of Lake Superior. The following table shows the succession of the S. R. in N. Y., where they are most typically developed.

UPPER SILURIAN.

IV. Oriskany formation.	Oriskany Sandstone (*Spirifer arenosus*).	Ludlow.
III. Lower Helderberg formation.	(4) Upper Pentamerus Limestone (*Pentamerus pseudogaleatus*).	
	(3) Delthyris Limestone (*Meristella lævis*).	
	(2) Lower Pentamerus Limestone (*Pentamerus galeatus*).	
	(1) Water-lime (*Tentaculites, Eurypterus, Pterygotus*).	
II. Salina formation.	Onondaga salt group, nearly barren of fossils.	
I. Niagara formation.	(3) Niagara Shale and Limestone (*Halysites, Favosites, Calymene Blumenbachii, Homalonotus delphinocephalus, Leptæna transversalis,* etc.).	Wenlock.
	(2) Clinton group (*Pentamerus oblongus, Atrypa reticularis,* etc.)	Upper Llandovery.
	(1) Medina group, Oneida conglomerate (*Modiolopsis orthonota*).	

[Specific and generic names in parenthesis are names of fossils found in the several formations. The names, Ludlow, etc., in the last column, show the subdivisions of the original British S. R. to which these N. Y. formations are to be referred.]

LOWER SILURIAN.

II. Trenton formation.	(3) Cincinnati (Hudson River) group (*Syringopora, Halysites, Diplograptus pristis, Pterinea demissa, Leptæna sericea.*		
	(2) Utica group—Utica Shale.		
	(1) Trenton group	Trenton Limestone.	*Graptolithus amplexicaulis, Trinucleus concentricus, Orthis testudinaria, Murchisonia, Conularia, Orthoceras* etc.
		Black River Limestone.	
		Birdseye Limestone.	

I. Canadian formation.
- (3) Chazy group—Chazy Limestone (*Maclurea magna*, *Maclurea Logani*, *Orthoceras*, *Illœnus*, *Asaphus*).
- (2) Quebec group (more than 100 species of trilobites of genera *Agnostus*, *Amphion*, *Conocoryphe*, *Illœnus*, etc., and more than 50 species of graptolites).
- (1) Calciferous group (graptolites, *Lingulella acuminata*, *Leptœna*, *Conocardium*, *Ophileta compacta*, 14 species of trilobites of genera *Amphion*, *Bathyurus*, *Asaphus*, *Conocoryphe*).

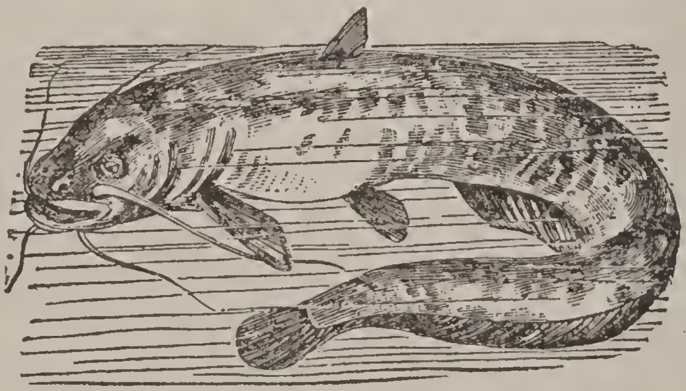
(The Potsdam formation—containing some sponges, the earliest forms of graptolites, some brachiopods, trilobites of genera *Conocoryphe*, *Agnostus*, *Dikelocephalus*, *Olenellus*, etc.—is, with the Acadian, referred to the Cambrian rocks.)

The rocks of the Canadian period are exposed to view in n. N. Y. and Canada; in n. Mich. and Wis.; in Vt. (Green Mts.); in the e. Appalachian chain s. from N J.; in Mo., Ark., and the Rocky Mts. The limestones of the Trenton group extend in a broad belt to Wis. and Mo., having in some places (Penn.) a thickness of 2,000 ft. The Cincinnati group (which constitutes the surface-rock in s.w. Ohio) consists of alternate layers of blue limestone and calcareous shale: it is identified with the Hudson River group. In the Upper Silurian the rocks of the Niagara formation—Oneida conglomerate and Medina sandstone, Clinton group, and Niagara shale and limestone—are to a great extent calcareous, and occupy a large portion of the continent of N. America.

The life of the period presents a group of very characteristic organisms, which, except the fish-remains in the upper beds, all belong to the invertebrata. Many of them are confined to the S. R. or occur very rarely in some of the Paleozoic formations. The Graptolites are a strictly Silurian family of Zoophytes, and most of the forms of Trilobites are found only in this period, though some members of the tribe are found in rocks of Devonian and Carboniferous age. Besides these may be specified such forms as Heliolites and Favosites among the Corals; Actinocrinites and the Cystidians among the Echinoderms; Orthis and Lingula among the Brachiopods; and Lituites and Maclurea among the Cephalopods.

In all the immense thickness of S. R., no deposit has been discovered containing organisms that have lived on land. Some fragments have been noticed that have a faint resemblance to the branches of Lepidodendron, and minute bodies occur in the bone-bed (top of the Upper Ludlow rock), which are referred to the spores of a terrestrial cryptogam. The only other indications of plants are impressions believed to have been produced by sea-weeds. The anthracitic shales of Wales and Scotland probably derived their anthracite from the algæ that must have abounded in the Silurian seas. In Shropshire a number of shells have been found, whose nearest allies are littoral species, and these appear to indicate the existence there of an ancient shore. The S. R. are, however, generally sea-deposits; and Forbes has ingeniously shown, from the small size of the Conchiferæ, the paucity of spiral univalves, the great number of floating shells and of the pelagic Orthidæ, and the great rarity, or absence, except in the upper beds, of fossil-fish, that it is most probable they were deposited in a sea more than 70 fathoms deep.

SILURIDÆ, *sĭ-lū′rĭ-dē:* family of malacopterous fishes, divided into many genera, and including a great number of species, mostly inhabitants of the lakes and rivers of warm countries. The S. have great diversity of form. Their skin is generally naked, but some have a row of bony plates along the lateral line, and a few are completely mailed with bony plates. The dorsal fin is single in some; others have two dorsal fins, the second sometimes adipose as in the salmon family. The dorsal fin is sometimes armed with a strong spinous ray, and in most of the family the first ray of the pectoral fins is very strong and serrated, so as to be capable of inflicting a severe wound, and by this these fishes are protected from alligators and other enemies. All have the mouth furnished with barbels, more or less numerous; the two principal barbels being on the upper lip, and formed by elongation of the intermaxillary bones. The barbels are believed to be organs of touch, probably of use in directing the fish to its prey. The bones of the head and other parts of the skeleton exhibit many peculiarities. The S. are generally inhabitants of muddy rivers, lurking among the mud. The only European species is the SLY SILURUS, SHEAT-FISH, or SHADEN (*Silurus glanis*), the largest of European fresh-water fishes, and sometimes found near mouths of rivers: it is plentiful in the Danube, the Elbe, and their larger tributaries, also in the rivers which fall into the Caspian Sea. It is found in some rivers of N. America. It attains a length of six or even eight ft., and a weight of 300 or 400 lbs. The flesh is white and fat; but soft, luscious, and not very easily digestible. In n. Europe it is preserved by drying, and the fat is used as lard. The habits of the fish are sluggish; it seems rather to lie in wait for its prey than to go in quest of it.—Several species of this family are found in the Nile, among which is the HARMOUTH or KARMOOT (*Clarias anguillaris*), a fish in general form and appearance much resembling that just described. It was anciently an object of superstitious regard in the Thebaïd. —N. America abounds with representatives of the family, both in species and numbers, known as Catfish (q.v.), now



Sly Silurus (*Silurus glanis*).

distributed among six or more genera—*Amiurus*, of eastern streams; *Ictalurus*, of the great lakes and the west; *Hopladelus; Noturus;* and two salt-water, *Ælurichthys* and *Ariopsis.*

SILVA, *sĭl′vă*, and SIL′VAN, *-văn:* see SYLVA.

SILVANUS, n. *sĭl-vā′nŭs* [L.]: in *Rom. myth.*, a deity among the Romans, who had the care of fields and cattle, and presided over boundaries. He was represented usually as old, and bearing a cypress plucked up by the roots; and the legend of Apollo and Cyparissus was transferred to him. The usual offering to S. was milk.

SILVAS, n. plu. *sĭl′văz*, or SELVAS, n. plu. *sĕl′văz* [Sp. *selva*, a wood—from L. *silva*, a wood]: flat woodland region, the w. portion of the great plain of the Amazon, in n.w. Brazil. (*Pampas* are the vast treeless S. Amer. plains; *Llanos*, the treeless plains along the Orinoco.) The Silvas, about one-third of the whole plain, contain more than 700,000 Eng. sq. m., and consist of low land on a dead level, densely covered with primeval forests, and annually inundated by the overflow of the mighty river or its tributaries. The forests are rendered wholly impenetrable by the denseness of the underwood, matted together as it is by creeping and climbing plants, which form myriads of festoons glowing with nature's brightest tints. The vegetation of the Silvas, under the stimulating action of the abundant irrigation, the intense tropical heat, and the inconceivable richness of the alluvium which constitutes the soil, shows an exuberance of growth far surpassing that of any other portion of the earth's surface, and from its very luxuriance, presents a bar to civilization no less effectual than do the barren deserts of Africa or the gloomy wastes of central Asia. The few travellers who have penetrated into this region have sailed up the Amazon and some of its tributaries; and from them we have received the little knowledge that we possess of this immense tract of wild forest. It is the haunt of innumerable wild animals, especially monkeys and serpents, and of a few aboriginal inhabitants, who are sunk in the lowest stage of barbarism.

SILVER, n. *sĭl'vėr* [AS. *seolfor;* Goth. *silubr;* Dut. *zilver;* Dan. *sölv;* Ger. *silber*, silver]: elementary body; metal of peculiar white color, having brilliant lustre, malleable, ductile, and soft when pure; one of the noble metals (see below); money made of silver; anything having the lustre or soft splendor of silver: ADJ. white like silver; made of silver; soft and clear, as in the tones of the voice; in *OE.*, soft; gentle; quiet: V. to cover or coat with silver; to cover with an amalgam of tin and quicksilver, as a looking-glass; to adorn with mild or silver-like lustre; to make hoary. SIL'VERING, imp.: N. act or operation of covering a surface with a thin film of silver, or with an amalgam of tin and mercury; the silver or amalgam laid on (for silvering of glass, see MIRROR). SIL'VERED, pp. *-vėrd.* SIL'VERY, a. *-vėr-ĭ*, having the appearance of silver; of mild or silver-like lustre; clear and soft as the sound of a silver bell; covered with silver. SILVER-BEATER, one who beats pieces of silver into thin leaves. SILVER-FIR, fir-tree, native of middle and s. Europe; the *Picĕa pectināta*, or *Abĭēs picĕa*, ord. *Conif'ĕræ.* SILVER-FISH, fish of the size of a small carp, of white color, striped with silvery lines. SILVER-GLANCE, mineral of blackish lead-gray color, being a sulphide of silver. SILVER LINING, the prospect of better and happier days, as in the proverb, 'every cloud has its silver lining.' SIL'VERSIDE, n. in *cook.*, the lower and choicer part of the buttock or round of beef, tender and close in grain; it is frequently corned. SILVERSMITH, one who works in silver. SILVER-STICK, n. the name given in England to a field-officer of the life guards when on palace duty. SILVER-WEED, roadside plant; *Potentilla anserīna*, ord. *Rosācĕæ.* SILVER WEDDING, 25th anniversary of the wedding-day. FULMINATING SILVER, explosive compound prepared from the oxide of silver and ammonia. GERMAN SILVER: see under GERMAN. TO BE BORN WITH A SILVER SPOON IN ONE'S MOUTH, to be born to good fortune; to be born under favorable auspices.

SILVER (symb. Ag, at. wt. 108, sp. gr. 10.53): metal which, in its compact state, is of brilliant white color, has the metallic lustre to a remarkable degree, is capable of being highly polished, and evolves a clear ringing sound when struck. It is harder than gold, but softer than copper, and is one of the most ductile of metals. It is malleable, may be hammered into very thin leaves, and may be drawn out into very fine wire, the thinnest S.-leaf having a thickness of only $\frac{1}{1000000}$ of an inch, and one grain of the metal being capable of yielding 400 ft. of wire. It has a high degree of tenacity, a wire of diameter of $\frac{1}{12}$ of an inch being able to support a weight of nearly 188 lbs. It requires a heat of 1,873°F. to fuse it, and on cooling expands at the moment of solidification. It is probably the best conductor of heat and electricity known, and is not affected by exposure even to a moist atmosphere at any temperature. When, however, it is fused, it absorbs considerable oxygen; which it expels in the act of solidification with a peculiar sound, technically know as *spitting.* Though ordinary air has no oxidizing action on S., ozonized air rapidly attacks it. But though it does not rust or become oxidized, it usually becomes tarnished on prolonged exposure to the air, owing to the formation of a film of sulphide (or sulphuret) of S.; and this change occurs more rapidly in towns than in the country, because sulphuretted hydrogen is more abundant in the atmosphere. S. is unaffected by the hydrates or nitrates of the alkalies, even at high temperature; hence S. crucibles, etc., are highly useful in many laboratory operations.

Hydrochloric and dilute sulphuric acid have scarcely any action on S., but nitric acid and boiling sulphuric acid oxidize it, and form salts; nitric acid being by far its best solvent. S. has strong affinities for chlorine, bromine, iodine, and sulphur; and combines with the first three and sulphuretted hydrogen at ordinary temperatures. It is well known that sodium chloride or common salt, especially in the melted state, when left for any time in contact with silver, corrodes that metal, soda being formed by combination of the sodium with the oxygen of the air, while the liberated chlorine attacks the silver.

S. is frequently found in the native state, crystallized in cubes or octahedrons, or occurring in fibrous masses. It is found also in combination with gold, mercury, lead, antimony, arsenic, sulphur, etc.; and sulphide of lead is almost always accompanied with more or less sulphide of S.; it is, however, never found as an oxide.

S. forms three compounds with oxygen—viz., monoxide, or argentic oxide, Ag_2O; argentous oxide, Ag_4O; and dioxide, Ag_2O_2; of these only the monoxide is a well-defined compound: they all have the common properties of being reduced by heat to the metallic state, and of being readily decomposed by action of light. The monoxide is a dark-brown heavy powder, devoid of taste or smell, somewhat soluble in water, to which it communicates metallic taste and alkaline reaction. It acts as a powerful base, neutralizing the strongest acids, and forming normal salts with them. It is obtained by addition of a solution of potash to a solution of the nitrate or any other soluble salt of S., falling as a hydrated oxide, which, at a temperature above 140°F., becomes anhydrous. If a concentrated solution of ammonia be digested for some hours upon freshly precipitated argentic oxide, Fulminate of Silver (q.v.), or Fulminating S. in the form of a black powder is produced, and the same dangerous compound is formed when an ammoniacal solution of nitrate or chloride of S. is precipitated by potash.

The salts which the monoxide forms with acids are characterized by the readiness with which they decompose—the mere action of light blackening and partially reducing them. None of these salts occur in nature. The following are the most important of those formed artificially.

Nitrate of Silver, $AgNO_3$, crystallizes in large, colorless, transparent square tablets, which blacken on exposure to light, or in contact with organic matters, owing to reduction; and dissolve in their own weight of cold or half their weight of boiling water. This property of producing a permanent black color with organic matters has led to its employment as a *marking ink* * for linen, etc. The black stains which it forms on the skin, on linen, etc., are metallic silver: it may be removed by a strong solution of iodide of potassium, or more readily by a solution of cyanide of potassium. The crystals fuse at a temperature of about 425° F., and the molten mass, cast into cylindrical molds, solidifies, and forms the sticks of *lunar caustic* used in surgery, medicine, and Photography (q.v,). Nitrate of S. is prepared by dissolving pure S. in moderately strong nitric acid, and evaporating till the solution is sufficiently concentrated to crystallize. "'The most characteristic test for the salts of S. is the action of hydrochloric acid, or of a soluble chloride, which produces a white curdy precipitate of chloride of S., insoluble in nitric acid, but readily soluble in ammonia; it is soluble also in hyposulphite of soda, with which it forms an intensely sweet solution; cyanide of potassium also dissolves it; the chloride of S. speedily assumes a violet tinge when exposed to light.'—Miller's *Elements of Chemistry*, 2d ed., II. 732.

Of the haloid salts of S., several occur native. The most important of these compounds is *monochloride*, or argentic chloride, $AgCl$, or rather Ag_2Cl_2, found native either in cubes or in a dense semi-transparent mass, and known as *horn silver:* it may be procured as a dense white flocculent precipitate by the procedure described in the preceding paragraph. For its sensibility to light, it is used in photography. When heated to about 500° F. it fuses into a yellow fluid, which, on cooling, solidifies into a yellowish gray semi-transparent horny mass. This salt is insoluble in water and in all the diluted acids, but dissolves in a solution of ammonia, from which it crystallizes in octahedra. Its solution in a solution of sodium hyposulphite is used in silvering iron, copper, and brass goods. Traces of this salt are found in sea water, the chloride of sodium probably acting as the solvent. *Bromide of Silver*, $AgBr$, or Ag_2Br_2, is found in Chili and Mexico, where it is known as *Plata verte*, or green S., in the form of small crystals or crystalline granules of pale olive green tint. *Iodide of S.*, AgI, or Ag_2I_2, occurs native in several Mexican mines in the form of thin, flexible, pearly scales.

Sulphide (or *sulphuret*) *of silver*, Ag_2S, is the principal ore of S. It occurs native, sometimes crystallized in cubes or octahedra, sometimes in masses. From its gray metallic lustre it has received from mineralogists the name *silver glance.* It is well known that if S. spoons are allowed to remain in contact with boiled eggs for some time, they become tarnished by the action of the sulphur, a minute quantity of sulphuretted hydrogen being probably evolved. The discoloration is easily removed by washing the darkened S. with a solution of cyanide of potassium. Sulphide of S. unites with various other metallic sulphides when fused with them, especially with the sulphides of arsenic and antimony. *Red silver ore*, or *pyrargyrite*, $AgSbS_3$, is a native compound of this kind.

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* Brande gives the following directions for preparing marking ink: Dissolve two drams of nitrate of silver and one dram of gum-arabic in seven drams of water, and color the liquid with Indian ink. The cloth must be first prepared by moistening the spot with a few drops of a soda solution, prepared by dissolving two ounces of crystallized carbonate of soda and two drams of gum in four ounces of water. Prof. Miller recommends, as a cheap indelible marking ink, a solution of coal-tar in naphtha; it resists the action of chlorine, and is used by bleachers to mark their goods.

The alloys of S. and copper (see ALLOY: MINT), when cast into ingots, are usually found to differ in their composition in the internal and external parts, in consequence of a molecular change, 'liquation,' during the cooling and slow solidification of the molten mass. In bars containing more than 719 parts of S. in 1,000, the central portions are richer in S. than the exterior; in alloys of less value, the reverse is observed; while in ingots containing 950 or more parts of S. in 1,000, the composition is nearly uniform throughout. When exactly 719 parts of S. and 281 of copper are combined (corresponding to the formula Ag_3Cu_2), no separation whatever of the metals occurs. Many metals, as tin, zinc, antimony, bismuth, arsenic, etc., when mixed with S., render it brittle and unfit for its ordinary uses; they are, however, easily removed in the process of refining. An alloy consisting of five parts of S., six of brass, and two of zinc, is used as a solder for S. An alloy of S. and mercury, known as *silver amalgam*, occurs native in a crystallized form; being found in Hungary, Sweden, Spain, Chili, and elsewhere: it consists of S. 34·8 parts, mercury 65·2. It is a mineral of silvery white color.

S., like gold, has been known and prized from the earliest ages. The S. mines of Mexico were, until recently, by far the richest known. Their estimated annual yield is about 1,600,000 lbs. troy of the pure metal. Until the remarkable discoveries of silver ore in Nevada, Arizona, Colorado, New Mexico, Utah, and Montana, dating from 1859, Chili and Peru had long stood next to Mexico in their yield, each furnishing about one-sixth of the produce of that country. Bolivia also is rich in S. The S. product of the United States 1858 was $500,000; (1861) $2,000,000; (1871) $23,000,000; (1881) $43,000,000; (1901) $71,387,800; the S. product of the world 1901 was estimated $235,000,000.

Of European countries, Spain is most productive, the richest mines being those of Hiendelaencina, province of Guadalaxara, extensively opened 1846. These have yielded immense wealth, but their produce has much declined since 1858. S. glance is the principal ore, though several others are found, including quantities of the formerly rare mineral freieslebenite, which contains about 23 per cent. of S. Next to Spain, Austria, Saxony, and the Harz district in n. Germany, yield largest supplies. The S. mines of Kongsberg, in Norway, likewise are valuable, and have been long famous. Great Britain has no S. mines, properly so called; but since the introduction 1829 of Pattinson's process for the desilverizing of lead smelted from argentiferous galena, a large quantity has been annually produced in this way (see LEAD).

The forms in which S. is found in nature are numerous; we need notice only a few of them. It is frequently found native in crystallized and amorphous masses, sometimes of considerable size: one fine piece of 500 lbs., found at Kongsberg, is now in the Copenhagen Museum. Specimens of native S. are found often with native copper in the Lake Superior mines, also in the S. mines of Nevada, etc.; but these are of no great size. On the whole, the quantity of S. found in nature in the metallic state is comparatively small. Its principal ores are the various sulphides or sulphurets—viz., S. glance, or sulphuret of S., containing when pure about 87 parts of S. and 13 of sulphur; brittle S. ore, or sulphuret of S. and antimony, whose composition is, S. 68·5, antimony 14·7, sulphur 16·4; and red S. ore, of which there is a dark and a light kind, the composition of the former similar to brittle S. ore, but it is a little less rich in S., and the latter differs only in containing arsenic instead of antimony. The bulk of the S. obtained in Mexico and S America is from these ores. The only other of much importance, except the mixed ores noticed below, is horn S., or chloride of S.: in a pure state, it consists of S. 75, chlorine 25. It occurs extensively in Mexico and Peru, and in certain districts of Nevada and Idaho; but is not common in European mines.

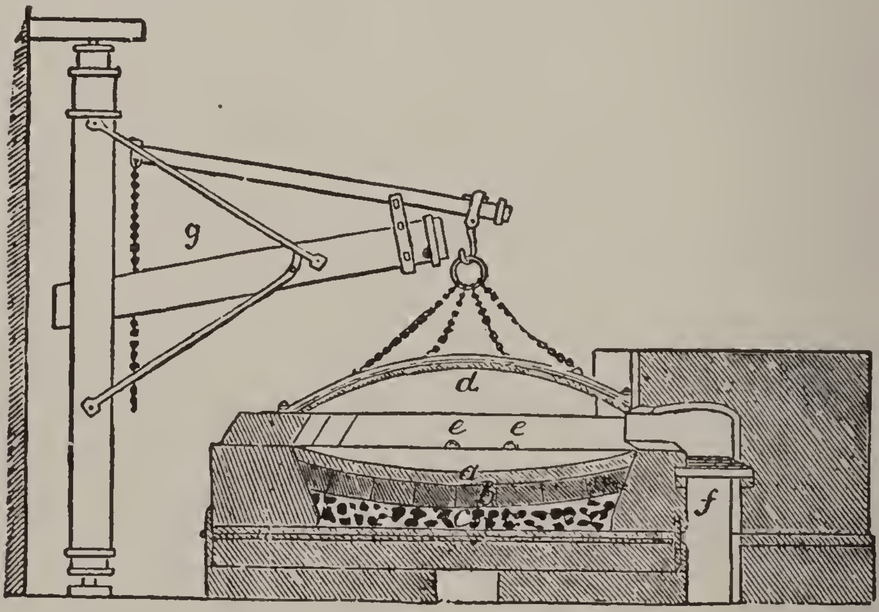


Fig. 1.—Silver Cupellation Furnace.

a, sole formed of wood ashes; *b*, bricks; *c*, bed of slag; *d*, dome of iron plate; *ee*, tuyères for bellows; *f*, fireplace; *g*, crane for lifting dome.

Besides the ores named above, a good deal of the S. of commerce is obtained from mixed ores; i.e., the ores of other metals are frequently found to contain it. In many cases, the amount of S. falls greatly short of 1 per cent. These ores are mostly sulphurets of lead, arsenic, copper, zinc, and iron.

In reduction of S. ores, the processes followed are based on the fact, that both lead and mercury have strong affinity for S. A more recent process depends on the solubility of chloride of S. in a hot solution of common salt, and its separation again on cooling.

The simplest process is ordinary smelting, and is applied only to the richest ores: these are crushed, mixed with old slag, lead in some form, and a little iron ore and lime. The mixture is then heated in a furnace with charcoal, which brings down the S. and lead together as an alloy. The S. is afterward easily separated by cupellation, for whose principle see Assay; but on the large scale, instead of a small bone ash cupel, a cupellation furnace, say 6 ft. in diameter, is used, of which fig. 1 is a section. Here the alloy is melted, bellows are used to remove the lead as litharge, or oxide of lead, and a cake of S. is left on the cupel forming the bottom of the furnace.

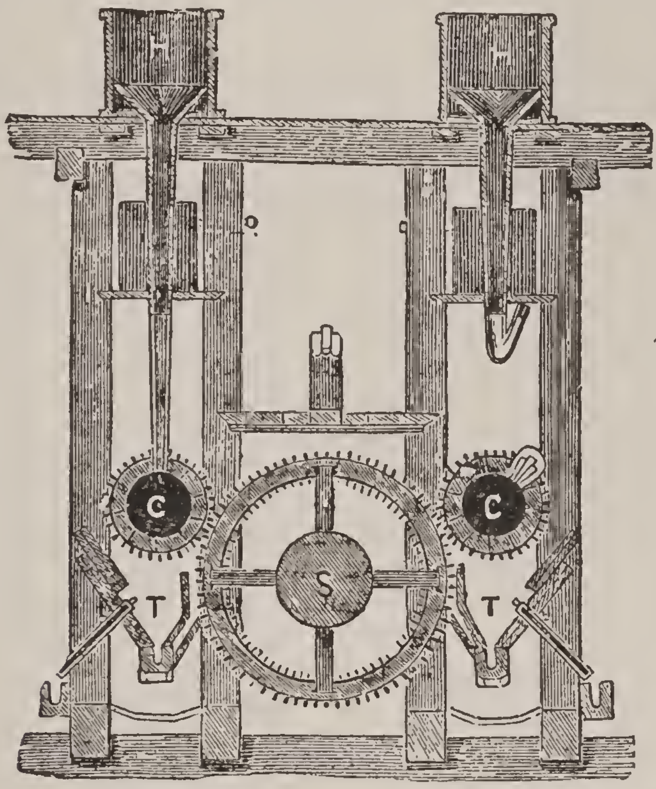


Fig. 2.—Vertical Section of Amalgamating Apparatus: CC, oak barrels; S, toothed wheel for setting barrels in motion; H, hoppers with hose for passing the mixed ore into the barrels; TT, troughs for the reception of the charge when the amalgamation is complete.

It happens that not many even of the richer ores are pure enough to be treated with advantage by simply roasting them with lead; accordingly, another plan, the amalgamation process, is more usual. The following is an outline of the way in which this is (or rather was) practiced at Freiberg in Saxony; the same process, with modifications, is employed in Nevada, Idaho, etc., for reducing the richer ores. The vein stuff (largely silica) containing a mixed ore of lead, copper, zinc, etc., as sulphurets, and only from 3 to 3½ oz. of S. per cwt., is ground to powder, as described under Metallurgy; but some sulphuret of iron also is present or must be added. About 10 per cent of common salt is then mixed with the ore, and the mixture heated in a Reverberatory Furnace (q.v.) to a temperature sufficient to expel water, and in part arsenic, zinc, and antimony. After two hours, the sulphur of the sulphurets takes fire, and is burned off as sulphurous acid, or converted into sulphuric acid, so that the metals become oxides and sulphates. The temperature of the furnace is now raised, when the chlorine of the common salt forms volatile chlorides with zinc, antimony, and iron, and a fixed chloride with S. During the roasting, the contents of the furnace are continually stirred, so that they ultimately form a coarse powder.

The product of the roasting furnace, after being ground to fine powder, is mixed in the proportion of 10 cwt. with 3 cwt. of water and 1 cwt. of iron in fragments; the mixture being effected in oak casks, which are then made to revolve two hours on their axes: see figs. 2 and 3. During the operation the iron decomposes the metallic chlorides in the roasted ore, forming chloride of iron, while the copper is partly reduced to sub-chloride and partly to metallic copper. If there is not enough iron present to convert the copper into sub-chloride, then mercury will be wasted in the next stage by conversion into its sub-chloride. Quicksilver to the amount of 5 cwt. is next run into each of the casks, which are then set in motion, and continue 22 hours at the rate of 12 revolutions per minute. The result of this is, that the S. being precipitated by the presence of metallic copper, is then dissolved by the mercury, but the amalgam so formed is usually a complex one.

To separate the amalgam from the earthy matters and the sulphates and chlorides, the barrels, hitherto only two-thirds full, are filled with water (the dilution throwing down any chloride of S. held in solution by the sea-salt), and kept revolving two hours; after which, by means of a stop-cock, the amalgam is allowed to flow into the amalgam chamber, and the rest of the contents, except the iron fragments, into a wash-tun. The superfluous quicksilver has next to be separated from the amalgam. This is done in bags of ticking, through which the mercury at first flows

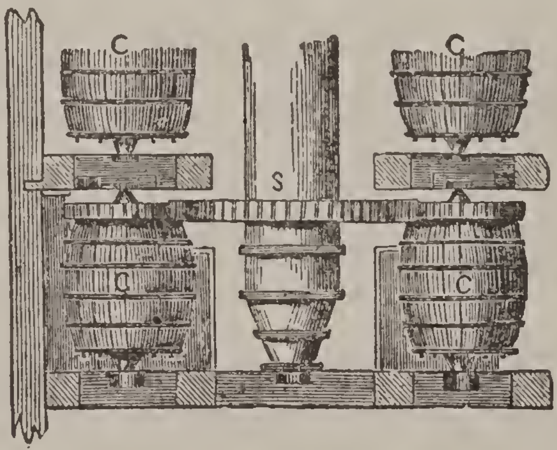


Fig. 3.—Plan of Part of Amalgamating Apparatus.

readily by its own weight, and is afterward squeezed out on a flat surface. The result of this operation is that the amalgam of mercury, S., copper, etc., is left in the bags: its actual composition being nearly 85 per cent of mercury, 10 per cent of S., and 5 of copper, lead, and antimony. Finally, the quicksilver of the amalgam itself is separated by heat in the distilling furnace, fig. 4. Here the amalgam is put into a row of iron pots, which go into a large retort. When heat is applied, the quicksilver volatilizes, and is condensed in a pipe attached to the retort, from which it is collected in a trough. The impure S. left in the retort is refined by fusion and subsequent cupellation.

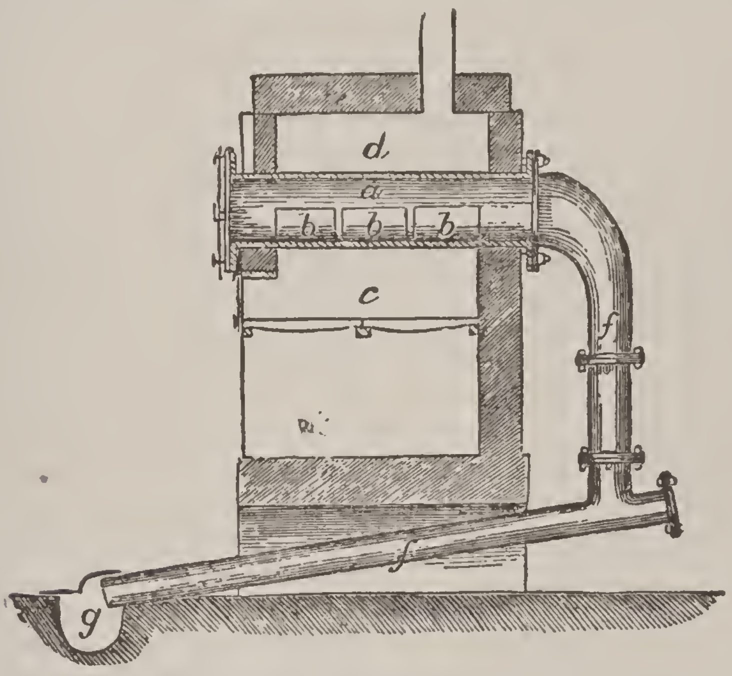


Fig. 4.—Furnace for Distilling the Amalgam:
a, iron retort; *b*, iron pots; *c*, fireplace; *d*, flue; *f*, condensing pipe *g*, trough for collecting mercury.

Another process has been used at Freiberg and elsewhere, by which the use of mercury is dispensed with. It consists in treating the ore as above described till it leaves the roasting-furnace. At this stage, the roasted ore is digested in a warm concentrated solution of sea-salt, which readily dissolves the chloride of S. The solution is then passed through wooden tubs containing metallic copper, which has the property of decomposing the chloride of S.: the chlorine unites with the copper to form chloride of copper, and the S. is precipitated. This process is now mostly abandoned; and at Freiberg an argentiferous copper matt obtained in smelting mixed ores is treated with sulphuric acid, by which sulphate of copper is formed, and the S. recovered from the residue. Of late years, Crookes's sodium-amalgam process has been used with advantage for extraction of S. in several American mining districts (see SODIUM-AMALGAM).

In Mexico, the ore containing small quantities of sulphide and chloride of S. is stamped or ground, together with water, in mills worked by horses or mules, and the fine mud thus produced is mixed on a floor with 3 to 5 per cent. of common salt by being trodden by mules. The mass is allowed to stand 24 hours, after which mercury is added, together with 'magistral,' an impure mixture of salts of iron and copper; then more mercury, and again the mass is trodden. Amalgamation having been completed, the slimy mass is washed in buddles worked by mules, whereby the lighter particles are washed away, and the heavier amalgam deposited. The amalgam is now filtered through canvas bags, and finally distilled; the S. left behind is melted into bars.

The physical and chemical properties of S. are such as make it specially valuable for many purposes in the arts: see ALLOY: MINT: PLATING: GALVANISM: ELECTRICITY (*Electroplating*): PHOTOGRAPHY. Ordinary mirrors have their *silvering* produced by a coating of an amalgam of tin and mercury; but for some years mirrors coated by a patent process with real silver, and backed by a layer of some composition which protects it from the blackening action of sulphuretted hydrogen, have been made in great numbers.

MEDICINAL USES OF SILVER.—*Nitrate of silver*, in small doses, is an excellent tonic, and it appears to exert almost a specific influence over some convulsive diseases. As a tonic, it is frequently prescribed in early stages of phthisis, and in irritability of the mucous membrane of the stomach; and epilepsy and chorea frequently yield to its influence when many other remedies have been tried in vain. There is unfortunately one great drawback to its administration—viz., that, when its use has been continued for some time, this salt communicates a permanent slate-like or bluish-gray hue to the skin. There is very little danger of this change of color occurring if the medicine is not administered for a longer period than three months. This peculiar effect on the skin, known as *macula argentea*, is not produced, it is said, by S. iodide, which, however, is supposed to be equally efficacious with the nitrate as a medicinal agent. In prescribing the nitrate, the physician begins with a small dose, about one-sixth of a grain, and gradually increases it to two or three grains, three times a day. It is best administered in pills made with some vegetable extract. For surgical uses of nitrate of S., see LUNAR CAUSTIC.

Oxide of silver is used in the same cases as the nitrate. It is recommended especially in chronic affections of the stomach, and in menorrhagia. It is administered in the same doses as nitrate. *Chloride of silver* has been employed in the same cases as the nitrate, and in certain forms of syphilitic disease; but it is of doubtful efficacy.

Silver as Money.—The use of S. as money can be traced back to very ancient times: the oldest coins known were struck in the reign of Phidon, king of Ægina, B.C. 869, though its use by weight in rings, bars, etc., is of much more ancient date. The value of S. compared to gold has always been greater in Asia than in Europe. In 1717 Sir Isaac Newton calculated the ratio in Japan at 9:1, while at the same time it was 15:1 in Europe. In Greece and Rome about 200 B.C. the ratio was about 10.1, while in Cæsar's time it varied from 7.5:1 to 12.5:1. The United States statistics of S. are given below:

Year.	Coining val. of product of U. S. mines.	Val. of silver coined.	Silver in treas. and in circulation.	Bullion val. of silver dollars.	Commercial ratio.
1793-1795	....	$370,683.80	....	......	15·31
1796-1800	....	1,069,770.95	....	......	15·61
1801-1805	....	469,948.00	....	......	15·46
1806-1810	....	3,099,217.25	....	......	15·75
1811-1815	....	2,622,316.50	....	.....	15·64
1816-1820	....	3,348,494.45	....	......	15·34
1821-1825	....	5,844,178.95	....	......	15·82
1826-1830	....	10,936,868.00	....	......	15·77
1831-1835	....	15,371,605.00	....	......	15·78
1836-1840	....	11,971,834.60	....	$1.0146	15·73
1841.....	....	1,132,750.00	....	1.0183	15·70
1842.....	....	2,332,750.00	....	1.0077	15·87
1843.....	....	3,834,750.00	....	1.0034	15·93
1844.....	*$250 000	3,013,250.00	....	1.0088	15·85
1845.....	50 000	1,873,200.00	....	1.0046	15·92
1846.....	50,000	2,558,580.00	....	1.0156	15·90
1847.....	50,000	2,374,450.00	....	1.0120	15·80
1848.....	50,000	2,040,050.00	....	1.0088	15·85
1849.....	50,000	2,114,950.00	....	1.0130	15·78
1850.....	50,000	1,866,100 00	....	1.0183	15·70
1851.....	50,000	774,397.00	....	1.0342	15·46
1852.....	50,000	999,410.00	....	1.0257	15·59
1853.....	50,000	9,077,571.00	....	1.0426	15·33
1854.....	50,000	8,619,270.00	....	1.0426	15·33
1855.....	50,000	3,501,245.00	....	1.0395	15·38
1856.....	50,000	5,142,240 00	....	1.0395	15·38
1857.....	50,000	5,478,760.00	....	1.0469	15·27
1858.....	500,000	8,495,370.00	....	1.0395	15·38
1859.....	100,000	3,284,450.00	....	1.0522	15·19
1860.....	150,000	2,259,390.00	....	1.0458	15·29
1861.....	2,000,000	3,783,740.00	....	1.0310	15·50
1862.....	4,500,000	1,252,516.50	....	1.0416	15·35
1863.....	8,500,000	809,267.80	....	1.0406	15·37
1864.....	11,000,000	609,917.10	....	1.0406	15·37
1865.....	11,250,000	691,005.00	....	1.0352	15·44
1866.....	10,000,000	982,409.25	....	1.0363	15·43
1867.....	13,500,000	908,876.25	....	1.0267	15·57
1868.....	12,000,000	1,074,343.00	....	1.0257	15·59
1869.....	12,000,000	1,266,143.00	....	1 0247	15·60
1870.....	16,000,000	1,378,255.50	....	1.0267	15·57
1871.....	23,000,000	3,104.038.30	....	1.0257	15·57
1872.....	28,750,000	2,504,488.50	....	1.0225	15 63
1873	35,750,000	4,024,747.60	$6,149,305	1.0046	15·92
1874.....	37,300,000	6.851,776.70	10,355.478	.9886	16·17
1875.....	31,700,000	15.347.893 00	19,367,995	.9643	16·59
1876.....	38,800,000	24,503.307.50	36,415.992	.8922	17·88
1877.....	39,800,000	28,393,045.50	56,464.427	.9288	17·22
1878.....	45,200,000	28,518.850.00	88,047,907	.8910	17·94
1879.....	40,800,000	27,569,776.00	117,526,341	.8685	18·40
1880.....	39,200,000	27,411,693.75	148,522,678	.8855	18·05
1881.....	43,000,000	27,940,163.75	175,384,144	.8801	18·16
1882.....	46,800,000	27,973,132.00	203,217,124	.8786	18·19
1883.....	46,200,000	29,246,968.45	233.007,985	.8647	18·64
1884.....	48,800,000	28,534,866.15	255,568,142	.8608	18·57
1885.....	51,600,000	28,962,176.20	283,478,787	.8353	19·41
1886.....	51,000,000	32,086,709.90	312,252,843	.7618	20·78
1887.....	53,350,000	35,191,081.40	352,993,566	.7564	21·13
1888.....	59,206,700	33,025,606.45	386,572,835	.7207	21·99
1889.....	64,768,730	35,496,683 15	420,548,929	.7204	22·10
1890.....	70,485,714	39,202.908 20	463,211,919	.8100	19·76
1891.....	75,416,565	27,518.856.60	516,602,202	.7604	20·92
1892.....	82,101,010	12,641,078.00	568,578,996	.6704	23·72
1893.....	77,575,757	8,802,797.30	615,715.899	.6008	26·49
1894.....	64,259,000	9,200,350.85	624,249,957	.4887	32·56
1901.....	71,387,800	30,028,167.20	169,467,266	.461	34·68

*Coining value of product of United States mines from 1792 to 1844 inclusive.

SILVER.

The following is a brief summary of silver legislation in the United States :

1652—First mint established in Boston, closed in 1688.
1785—Congress adopted the Spanish milled dollar as unit of value.
792--First United States mint established, and silver dollar of 371¼ grains pure silver made the standard : ratio to gold, 15:1.
834-37—Value of gold coins reduced (silver dollar remaining the same) to make the ratio 15·988:1.
1873—Silver dollar dropped from coinage.
1878—Bland-Allison act providing for coinage of $2,000,000 per month.
1890--Sherman law passed providing for purchase of 4,500,000 oz. silver bullion per month.
1893—Sherman law repealed.

See Money : Mint : Gold : Currency : Bimetalism.

SILVER, Free Coinage of : During the presidential election campaign of 1896 for the first time in the United States the free coinage of silver became an issue of national importance. The wide circulation of ‘Coin's Financial School’ (a popular plea for silver) and the debate on the question in congress preceding the campaign had prepared the people for the question. Briefly, the proposition is that the U. S. government purchase and coin all silver offered at the present established ratio of nearly 16 ounces of silver to one ounce of gold. The advocates of the plan call attention to the fact that this has been the policy of the United States from the beginning till 1873, when silver was demonetized. Silver, it is claimed, was the standard of values adopted by the first coinage act of 1792, and the silver dollar has remained of the same weight of pure silver, while the weight of the gold dollar has been changed to a lighter weight 1834, and to a slightly heavier weight 1837. After silver was demonetized its advocates say it has still remained the standard of values, while gold has risen in value, thus forcing lower prices for the producer's goods, and at the same time compelling him to pay his debts with the enhanced currency, which costs him twice as much labor to obtain.

Those who oppose free coinage say that the fall in prices has been due to increased cheapness and abundance of production ; that gold has not risen in value, but silver has fallen because it also has become vastly more abundant and can be produced with less labor than formerly ; that it was this very fall in the commercial value of silver which forced the United States and other nations to close their mints to its coinage or to restrict its use.

The following tables give the imports and exports of silver :

Years Ending June 30.	Imports.	Exports.	Years Ending June 30.	Imports.	Exports.
1879......	$14,671,052	$20,409,827	1891......	$18.026.880	$22.590.988
1880......	12,275,914	13,503,894	1892......	19.955.086	32.810.559
1881......	10,544.238	16,841,715	1893......	23.193.252	40,737,319
1882......	8,095.336	16,829,599	1894......	*13,286,552	50.451,265
1883......	10,755,242	20,219,445	1895......	*20,211,179	47,295.286
1884......	14,594.945	26,051,426	1896......	*28,777,186	60.541,670
1885......	16,550,627	33.753,633	1897.. ...	*30,533,227	61.946,638
1886......	17,850,307	29,511,219	1898......	*30.927,781	55.105,239
1887......	17,260,191	26.296.504	1899......	*30.675.056	56.319,055
1888......	15,403.669	28,937,949	1900......	*35.256.302	56,712,275
1889......	18,678.215	36,689.248	1901......	*36.386,521	64.285,180
1890......	21,032,984	34.873.929	1902......	28.232,254	49.732.390

*Includes silver in ore.

SILVER.

Gold advocates point to the enormous increase in production of silver since 1873, which has averaged 96,000,000 ounces a year, against only 35,000,000 ounces a year 1848–73, and only 21,000,000 ounces a year for the first 48 years of the century. This increase in production, they say, is sufficient to account for the decrease in price. But the silver advocates call attention to the enormous increase in the production of gold, which has risen from about 700,000 ounces a year during the first half of the century to over 5,000,000 ounces a year since the discovery of gold in California and Australia. From 1848–73, as they point out, the annual production of gold had increased seven-fold, while the production of silver was only a half greater. Yet while the productive ratio of silver to gold was only 6·64 to 1, the commercial ratio, which was the price of silver in the open markets of the world, was 15·48 to 1, or practically the same as for the half century before. That silver fell in price after 1873, as measured in gold, was due, they say, not to its increased production, but to its demonetization, which largely restricted the demand for it and at the same time increased the demand for gold. The ratio of production of silver and gold, they say, has been no greater since 1873 than for the 200 years prior to this century, when the commercial ratio remained practically constant. To the 'crime of 1873' in the demonetization of silver and the subsequent steady fall in values, the silver men ascribe the cause of all recent financial ills, and insist that the cure can come only by restoring silver to its old position.

Here the gold advocates take sharp issue. They say that even granting that demonetization of silver has caused its fall in price (which they do not grant), to return to free coinage of silver would not better matters. The country would be flooded with silver dollars, which as bullion could be purchased in the open market at about 50 cents on the dollar. This would mean a 50-cent dollar with which to transact business and pay debts—hence the campaign cry of the 'dishonest dollar.' The silver advocate either denies that the 'cheaper dollar would drive out the dearer' and give a silver basis, or else frankly admits its truth and appeals to the debtor class for its support.

A middle ground is held by the international bimetalists—that while the United States alone cannot without injury adopt free coinage of silver, that move could be taken with safety in conjunction with the other leading commercial nations of the world. Such agreement they hold would immediately restore the old commercial ratio between the two metals, which would remain approximately the coinage ratio, and so remove all risk of a cheaper currency. This would enlarge the solid money basis, and so make easy and safe an increase in the volume of paper currency, with a consequent easing of the money market, causing a stimulation of prices and wages and an increased demand for the products of industry. A currency commission appointed by Pres McKinley 1897 has been making strenuous efforts to bring about such an agreement, but with no more success than attended similar commissions. England which was the first to adopt the gold standard, steadily refuses to have anything to do with the agreement, and other leading nations dare not adopt the measure without her help Meanwhile nation after nation is joining the gold standard-group, and the relative price of silver from time to time to time drops lower and lower.

SILVERSIDE, or Sil'ver-fish : see Atherine.

SILVES'TER, Pope of Rome : see Sylvester.

SI'MA : see Cyma.

SIMANCAS, *sē-mân'kâs :* village, in Spain, 7 m. s.w. of Valladolid ; famous as the place where the national archives of Spain are kept, having been removed hither by Cardinal Ximenes.—Pop. 1,258.

SIMAR. n. *sĭ-mâr'*, or Simar'ra, n. *-ră* [mid. L. *samarra*] : sack-like robe, painted with devils, flames, etc., in which the victims of the Inquisition were burned ; a robe like it.

SIMARUBACEÆ, *sĭm a·rô bā'sē-ē :* natural order of exogenous plants, consisting of trees and shrubs ; with alternate, generally compound leaves, without stipules ; regular, generally hermaphrodite flowers. The species are not numerous ; they are found in tropical Asia, Africa, and America. The whole order is characterized by great bitterness, and several of the species are used as tonics in dysentery, etc. Quassia (q.v.) and Bitterwood (q.v.) belong to it.

SIMBIRSK, *sĭm bērsk' :* government in Russia, bounded e. by the Volga, w. by the govts. of Nijni-Novgorod and Penza ; 19,050 sq. m. The surface is mostly level, and the soil of remarkable fertility, and there are excellent and extensive meadows and pasture-grounds. The fisheries and the commerce on the Volga, and cattle-breeding, are important. Pop. (1882) 1,471,864 ; (1889) 1,579,847.

SIMBIRSK' : town, cap. of the Russian govt. of S. ; on the right bank of the Volga, 220 m. s e. of Nijni-Novgorod. Leather, soap, and candles are manufactured, considerable trade is carried on by the Volga, and there is a famous annual fair. S. suffered severely from fires 1864 and 5. Pop. (1880) 36 600 ; (1888) 39,047.

SIMCOE, *sĭm'kō*, John Graves : British soldier : 1752, Feb. 25—1806, Oct. 26 ; b near Exeter, England. His father, a capt in the navy, was killed at the siege of Quebec. At the age of 18 S. entered the army as ensign, and during the Amer. revolution he raised and commanded a battalion called the Queen's Rangers, which did good service for the loyalists. He was in the battles of Brandywine and Monmouth, and was wounded on both occasions ; was included in the capitulation of Cornwallis at Yorktown ; 1790 was promoted col., 1794 maj.gen , and 1798 lieut.gen. From 1791–94 he was gov. of Upper Canada ; and during his administration was charged with encouraging Indian hostilities against the U S. He was gov. and milit. commander of San Domingo 1796–7. He died at Torbay, England.

SIMCOE, *sĭm'kō*, LAKE: in Ontario, Can., between Lake Ontario and Georgian Bay; greatest length, 30 m.; greatest width 18 m.; 170 ft. above Lake Huron, into which it discharges its waters through Lake Couchiching, the Severn, and Georgian Bay. It contains many islands, some inhabited by Indians; and it abounds in excellent whitefish. Its banks are covered with trees. It was named after Gen. Simcoe, as were the county and town of the same name.

SIMEON, *sĭm'ĭ-on*, CHARLES: notable evangelical preacher of the English Church: 1758, Sep. 24—1836, Nov. 13; b. Reading, Berkshire. Educated at Eton and Cambridge, he was ordained a priest 1782. His first religious impressions occurred during his residence at the univ., and produced a permanent change in his character. From a somewhat vain and light-minded youth, he passed into an ardent and zealous preacher of the strictest evangelical doctrines and precepts; and this he remained during the 54 years of his public ministry. Appointed vicar of Trinity Church, Cambridge, 1782, and vice-provost of his own college (King's) 1790, he held these offices through life. As a preacher, S. was distinguished for impassioned evangelicalism in language, sentiment, and doctrine, which soon roused a bitter and protracted opposition. His earnestness, however, met its due reward. Friends and followers sprang up; and in course of time S. became a centre of evangelical influence, that began to spread itself over the whole church, and gave birth to its great foreign missionary activity in recent years. S. may even be regarded as the founder of the 'Low-church' party; and on the whole fairly represents their earnestness, dogmatism, and their grade of intellect and scholarship. For an account of S.'s life and labors, see *Memoirs of the Rev. Charles Simeon*, by the Rev. W. Carus (Lond. 1857). S.'s *Horæ Homileticæ* (21 vols. 1832) are very popular among sermon-readers and sermon-makers of evangelical tendencies.

SIM'EON STYLI'TES: see PILLAR SAINTS.

SIMFEROPOL, *sĭm-fĕr-ō'pŏl:* town of Russia, in the Crimea, cap. of the govt. of Taurida; on the Salghir, 45 m. n.e. of Sebastopol. The valley of the river is studded with charming villas, and the town is surrounded by gardens, and has a picturesque appearance. The older part comprises the old Tartar town of Ak-Metchet, or White Mosque: the new part, containing the government buildings, is very handsome. Fruits are largely grown in the vicinity, and exported. Pop. (1881) 29,030; (1888) 36,503.

SIMIA, n. *sĭm'ĭ-ă* [L. *simĭa*, an ape—from L. *simus;* Gr. *simos*, flat-nosed: It. *simo*, flat-nosed]: an ape; the systematic name for apes and monkeys (see MONKEY): plu. SIM'IÆ, *-ĭ-ē.* SIM'IOUS, a. *-ŭs*, or SIM'IAN, a. *-ĭ-ăn*, or SIM'IAL, a. *-ĭ-ăl*, pertaining to or resembling a monkey or ape; having the character of an ape.

SIMILAR, a. *sĭm'ĭ-lėr* [F. *similaire;* It. *similare*, similar—from L. *simĭlis*, like]: resembling; having a like form or appearance; like in quality. SIM'ILARLY, ad. *-lĭ.* SIM'ILAR'ITY, n. *-lăr'ĭ-tĭ*, likeness; resemblance.

SIMILAR FIGURES, in Geometry: figures which exactly correspond in shape, but may or may not be of the same size. If the figures be rectilineal, then the criterion of similarity is that every pair of corresponding sides have the same ratio to each other, and that each angle of the one figure be equal to a corresponding angle of the other. If the figures be triangular, the proportionality of the sides carries with it the equality of the angles, and *vice versâ*, but only in this case. *Similar segments* of circles are those in which, and on whose bases, similar triangles can be inscribed; or, as it is otherwise expressed, those which contain equal angles—a satisfactory test that they are each the same part of their respective circles. *Similar solids* are those bounded by similar planes similarly situated to each other. All similar plane figures are to one another as the squares of any corresponding sides, and all similar solids are as the cubes of their corresponding sides. Thus, a circle which has 3 (3 : 1) times the diameter of another, has 9 ($3^2 : 1^2$) times its area, and a globe which has 3 (3 : 1) times the diameter of another has 27 ($3^3 : 1^3$) times the volume.

SIMILE, n. *sĭm'ĭ-lē* [L. *similis*, like: It. *simile*, like]: a common figure of speech, in which two things which have some strong point or points of resemblance are compared. SIMILITUDE, n. *sĭ-mĭl'ĭ-tūd* [F.—L.]: likeness in qualities or appearance; resemblance; comparison; simile.

SIMILITER, ad. *sĭ-mĭl'ĭ-tėr* [L. *simĭlĭter*, in like manner]: in *law*, a form in pleading in which either party accepts the issue tendered by the other.

SIMILOR, n. *sĭm'ĭ-lŏr* [F.—from L. *similis*, like; *aurum*, gold]: an alloy of red copper and zinc to imitate gold: also SEMILOR.

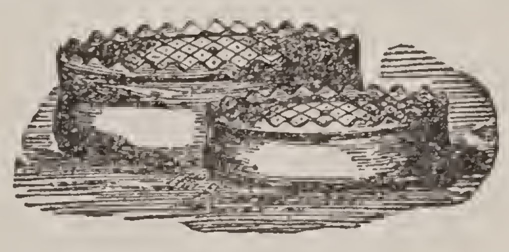
SIMLA, *sĭm'la:* British sanatorium, the summer cap. of India; in n.w. of India, about 170 m. in direct line n. of Delhi; among the hills of the lower Himalaya system, 7,084 feet above sea-level. It consists of a number of houses irregularly scattered over a mountain-ridge, with a noble panorama on all sides of it. European fruits and vegetables are successfully cultivated, and the climate is cool and salubrious. Pop. fluctuating (1871) 7,037; (1881) 13,258.

SIMMER, v. *sĭm'mėr* [Dan. *summe;* Ger. *summen;* Sw. *summa*, to hum: an imitative word]: to boil gently or with a suppressed hissing noise. SIM'MERING, imp. SIM'MERED, pp. *-mėrd.*

SIMMONS, or Symmons, n. plu. *sĭm'mŏnz* [Icel. *sime,* a slender rope]: in *n. of Scot.*, ropes made of heath or heather.

SIMMS, *sĭmz,* William Gilmore: author: 1806, Apr. 17—1870; b. Charleston, S. C.; of Scotch-Irish extraction. He made verses at the age of seven; and during the war of 1812, celebrated in rhyme the exploits of the American army and navy. Left in charge of his grandmother at Charleston, he was placed with a druggist; but at 18 began the study of law; was admitted to the bar at 22; published *Early Lays* and *Lyrical and Other Poems* (1827); and became (1828) editor of *The City Gazette*, and published *The Vision of Cortes, Cain, and Other Poems* (1829), and *The Tri-Color*, poetical glorification of the French Revolution (1830). In 1832, his paper, opposing nullification, failed; and he lost his wife, father, and grandmother, and took refuge in New England, where, at Hingham, Mass., he wrote his best poem, *Atalantis, a Story of the Sea* (1833); and the same year, *Martin Faber*, the story of a criminal. From this time, he poured out poems, novels, histories, and biographies in rapid succession. His works, other than poems and novels, comprise a History of South Carolina; South Carolina in the Revolution; Lives of Gen. Marion, Capt. John Smith, Chevalier Bayard, Gen. Greene; Civil War in the South; American Loyalists of the Revolution; Views and Reviews of American Literature; The Morals of Slavery, etc. Residing in S. C. during the war of secession, he sustained the southern cause in a weekly newspaper, and had his house and library wrecked by federal soldiers. Of his various and voluminous works, some are of high excellence.

SIMNELS, n. plu. *sĭm'nĕlz* [OF. *simenel,* cake of fine wheat flour—from mid. L. *siminel'lus,* bread of fine flour—from L. *simila,* fine wheat flour: Ger. *semmel,* a roll, as of bread]: bread or cakes of fine wheat flour; *now,* fancy spiced cakes; rich cakes eaten in Lancashire and other parts of Eng. at mid-Lent from early times.



Simnel-cakes.

SIMODA, *sē-mō'da* (Lowland): port of Japan, at the s. extremity of Cape Idzu, about 80 m. from Yeddo, opened to foreign commerce by the Americans 1854. In 1854 the town was nearly destroyed by an earthquake, while the harbor was so scoured out that hardly any holding-ground was left for ships on the granite bottom. Pop. formerly estimated 80,000; now reckoned at about 4,000.

SIMON, *sē-mōng′*, JULES (JULES FRANÇOIS SIMON SUISSE), French philosopher and statesman: b. Lorient, 1814, Dec. 31. For some years a teacher and lecturer, he succeeded Cousin 1839 in the chair of philosophy at the Sorbonne, which he occupied until forced to resign because of his opposition—as member of the constituent assembly—to the *coup d'état* 1851. He was elected to the legislature 1863 and 69. After the republic was restored, 1871, he was minister of education and religion under Thiers two years, when he returned to the national assembly. In 1875 he was pensioned, 6,000 francs, and chosen senator for life and mem. of the Acad. At this time he led the republican 'left,' and was its most frequent and eloquent speaker. He was commissioned by Pres. MacMahon to form a new cabinet 1876, Dec., of which he was pres., with the portfolio of the interior, and declared himself conservative republican. He tried to conciliate the clerics by interdicting Père Hyacinthe, and, on the other hand to prosecute the anti-republican Cassagnac; but the cabinet had to resign 1877, May 17, in favor of the reactionists. He upheld the 'centre,' and was opposed alike to the commune and the monarchists, resisting the amnesty 1880. He demanded the recognition of God (1881) in school instruction and the laws, and (1884) spoke against divorce. S. was director and collaborator of leading journals. Among his numerous books are *Duty* (1854); *National Religion* (1856); *Liberty of Conscience* (1859); *Liberty*, two vols. (1859); *The School* (1864); *Labor* (1866); *Radical Politics* (1868); *God, Country, and Liberty* (1883); *Opinions and Speeches* (1888). He d. 1896, June 8.

SIMON, *sī′mon*, RICHARD: orientalist and critical scholar: 1638, May 13—1712, Apr.; b. Dieppe. Having completed his studies, he entered the Congregation of the Oratory 1659, but soon withdrew, returning, however, 1662. Eventually he turned his studies to theology, oriental languages, and biblical criticism. While a member of the Oratory he published his well-known work on the doctrine of the oriental church regarding the Eucharist, designed as a supplement to the celebrated *Defense of the Perpetuity of the Faith in the Blessed Eucharist*, by Arnauld and Nicole, but criticising that work severely. This and other controversies led to his again withdrawing from the Oratory 1678, retiring to Belleville as curé; but 1682 he resigned his parish, and lived in literary retirement, first at Dieppe, afterward in Paris. In failing health he returned to Dieppe, where he died. Few writers of his age were so prominent in the world of letters, especially in its polemics. There is scarcely a critical or theological scholar among his contemporaries with whom he did not break a lance—Spanheim, Le Clerc, Du Pin, Jurieu, and Jurieu's great antagonist, Bossuet. His principal work is *Histoire Critique du Vieux Testament* (Paris 1678), in which he anticipates the most important conclusions of the later rationalistic scholars of Germany, also their method of investigation; e.g., he conceives himself to have disproved the Mosaic authorship of the Pentateuch, and assigns its composition to the scribes of the time of Ezra. Other writings of S.'s are *Histoire Critique du Texte du Nouveau Testament* (Rotterd. 1689); *Disquisitiones Criticæ de Variis Bibliorum Editionibus* (1684); *De l'Inspiration des Livres Sacrés* (Rotterd. 1687); and *L'Histoire Critique des Principeaux Commentateurs du Nouveau Testament* (Rotterd. 1692), in which he assails the theology of the Fathers, particularly Augustine, as a departure from the simple and less rigid doctrines of the primitive church. Among the Fathers, his most esteemed authority was Chrysostom; though indeed he seems not to have accepted the opinions of any of the Fathers as authority, and to have had contempt for tradition. Bossuet replied to this last work by *Defense de la Tradition et des Saints Pères.* S. frequently published under assumed names—as his *Dissertation Critique* on Dupin's *Library of Ecclesiastical Writers*, under the name of Jean Reuchlin; and *Histoire de l'Origine et du Progrès des Revenus Ecclésiastiques* under the name Jerome Acosta. No collected ed. of his works has appeared: the most famous of them are displaced by recent, and often second-hand compilations.

SIMONIDES, *sī-mŏn'ĭ-dēz,* of Ceos: celebrated Greek lyric poet: B.C. 556—B.C. 467; b. Iulis, in the island of Ceos. He was educated probably with a view to music and poetry as his profession. Hipparchus, by means of great rewards, induced him to reside at Athens, where also lived at that time Anacreon, and Lasus, the teacher of Pindar, though no intimacy seems to have sprung up between S. and his two rivals. It was probably after the expulsion of Hippias B.C. 510, that he took up his residence in Thessaly, under the patronage of the Aleuads and Scopads, who appear to have treated him in a niggardly fashion. Shortly before the invasion of Greece by the Persians, he returned to Athens, and employed his poetic powers in elegies, epigrams, dirges, etc., in connection with that momentous struggle—taking the prize, in regard to the battle of Marathon, out of the hands of his rival Æschylus. In B.C. 477, when S. was 80 years of age, he came off victor for the 56th time in a poetical contest at Athens. Shortly after this, he went to reside at the court of Hiero of Syracuse, where he died at the age of 90. S. appears to have scandalized his contemporaries by writing for hire; and Pindar, his great rival, accuses him of avarice. His poetry is imbued with a morality high for his times. He brought to perfection the elegy and epigram, and excelled in the dithyramb and triumphal ode; he seems also to have completed the Greek alphabet by the addition of the double letters and long vowels, and to have invented the art of artificial memory. The characteristics of his poetry are sweetness, polish combined with simplicity, genuine pathos, and great power of expression, though in originality he is much inferior to his contemporary Pindar. The best ed. of his fragments is that of Schneidewin, entitled *Simonidis Cei Carminum Reliquiæ* (Brunswick 1835).

This S. must be distinguished from the iambic poet SIMONIDES of Amorgos, who lived about 100 years previous.

SIMONOSEKI, *sĭm-ō-nō-sā'kē:* town of Japan, 33° 56' n. lat., 131° e. long ; at the s.w. extremity of the island of Nipon, at the entrance of the inland sea Suonada. It is surrounded by hills, and consists largely of one main street. The warehouses—principal buildings—are of mud and wood, coated with cement, and are said to be fireproof. S. is a depot for receiving European imports from Nagasaki, to be sent into the interior; also for the produce from Osaca, which is re-shipped to Nagasaki and other places. —Pop. 30,825.

SIMONTON, *sī'mon-ton*, James William: journalist: 1823, Jan. 30—1882 Nov. 2 ; b. Columbia co., N. Y. He obtained his education in the public schools of New York, became local reporter for the *Courier and Enquirer* 1843, and soon afterward went to Washington to report congressional affairs. In this position he remained till 1850, and gained the friendship of Webster, Clay, Benton, and other eminent men of that day. He was associated with George Jones and Henry J. Raymond in founding the *New York Times*, 1851, served as its Washington correspondent several years, also furnished news-letters for some of the leading papers of the south and west. Removing to San Francisco 1859, he bought an interest in the *Evening Bulletin*, and afterward became one of the proprietors of the *Morning Call*. He served as war-correspondent 1861–65, was agent of the Associated Press in New York 1867–81, and resigned in the latter year on account of ill health. He died at Napa, California.

SIMONY, *sĭm'ŏ-nĭ* [from *Simon* Magus, who offered to purchase with money the power of bestowing the gift of the Holy Spirit from the apostles]: crime of illegally buying or selling ecclesiastical preferment; corrupt presentation to a benefice for 'money, gift, or reward'—but an offense punishable only by ecclesiastical law in England, not by criminal law. Simoniac, n. *sĭ-mō'nĭ-ăk*, one who illegally buys or sells preferment in the church. Simoniacal, a. *sĭm'ŏ-nī'ă-kăl*, guilty of simony, or tainted with it. Sim'oni'acally, ad. *-lĭ*. Simonian, n. *sĭ-mō'nĭ-ăn*, follower of Simon Magus, whose creed was of the Gnostic kind (see Gnostics).—*Simony* is the sale, or attempted sale, of things spiritual, or of 'anything annexed to spirituals,' for money or for anything of a 'temporal' nature. In the canon law S. has always been regarded as a heinous offense, punishable with privation of benefice and deposition from orders if the offender was a cleric ; nevertheless S. was one of the crying evils of the mediæval church.

Under the Eng. law, it is not S. for a layman or spiritual person, not purchasing for himself, to purchase while the church is full, either an advowson or next presentation, however immediate may be the prospect of a vacancy, unless that vacancy is to be occasioned by some agreement or arrangement between the parties. Nor is it S. for a spiritual person to purchase for himself an advowson, though under similar circumstances. It is, however, S. for any person to purchase the next presentation while the church is vacant ; and it is S. for a spiritual person to purchase for himself the next presentation, though the church be full.—In the United States, law takes no cognizance of simony.

SIMOOM, n. *sĭ-môm'* [Ar. *samûm*, what is hot or poisonous or dangerous—from *samm*, poisoning]: the hot suffocating winds peculiar to the hot sandy deserts of Africa and w. Asia, and to regions contiguous to them. In Egypt, it is called *khamsin* [Ar., fifty] because it generally continues to blow for 50 days, from the end of April to the time of the inundation of the Nile, in June.

Owing to the great power of the sun's rays, the extreme dryness of the air, and the small conducting power of sand causing the accumulation of heat on the surface, the superficial layers of sand in the deserts of Africa and Arabia often become heated to 200° F. to a depth of several inches. The air, also, resting on this hot sand becomes highly heated, thus giving rise to ascending currents; air consequently flows toward these heated places from all sides and these different currents meeting, cyclones or whirling masses of air are formed, which are swept onward by the wind prevailing at the time. Since the temperature, originally high, is still further raised by the heated grains of sand with which the air is loaded, it rapidly increases to a degree almost intolerable. In the shade, it was observed by Burckhardt 1813 to have risen to 122°; and by the Brit. embassy to Abyssinia, 1841, to 126°. It is to the parching dryness of this wind, its glowing heat (about 200° in the sunshine), and its choking dust, and not to any poisonous qualities it possesses, that its destructive effects on animal life are to be ascribed.

The approach of the S. is indicated first by a thin, often reddish dun haze along the horizon, which rapidly becomes denser, and quickly overspreads the whole sky. Fierce gusts of wind follow, with clouds of red and burning sand, which often present the appearance of huge columns of dust whirling forward; and vast mounds of sand are transported from place to place by the terrible energy of the tempest. By these mounds of sand, large caravans are frequently destroyed; and even great armies have been overwhelmed by them, as in the case of Cambyses, who was overtaken by the S. on his march through the desert to pillage the temple of Jupiter Ammon, and perished with 50,000 of his troops. The destruction of Sennacherib's army is supposed to have been caused by the Simoom. The S. generally lasts 6 to 12 hours, but sometimes longer.

The effects of this wind are felt in neighboring regions, where it is known under different names, and it is subject to important modifications by the nature of the earth's surface over which it passes. In Italy, it is called the *Sirocco* (q.v.), which blows occasionally over Sicily, s. Italy, and adjoining districts: this is a hot moist wind, receiving its heat from the Sahara, and acquiring its moisture in its passage n. over the Mediterranean. It is the plague of Sicily and Naples, and while it lasts a haze obscures the atmosphere, and such is the fatigue which it occasions that the streets of Palermo become deserted.

The sirocco sometimes extends to the shores of the Black and Caspian Seas, and under its blighting touch, sheep and cattle die in the steppes beyond the Volga, and vegetation is withered and dried up It is called the *Samiel* in Turkey, from its reputed poisonous qualities.—The *Solano* of Spain is a s.e. wind, extremely hot, and loaded with fine dust, which prevails at certain seasons in the plains of Mancha and Andalusia, particularly at Seville and Cadiz. It produces giddiness, and heats the blood to an unusual degree, causing general uneasiness and irritation; hence, the Spanish proverb: 'Ask no favor during the Solano.'—The *Harmattan* (q.v.) of Guinea and Senegambia belongs to the same class of winds.

SIMOUS, a. *sī'mŭs* [L. *simus;* Gr. *simos*, flat-nosed]: having a flat or snub nose, with the end turned up; snub-nosed.

SIMPER, v. *sĭm'pėr* [prov. Dan. *semper* or *simper*, affected, prudish: prov. Ger. *zimpern*, to be affectedly coy: Sw. *sipp*, finical, prim: Dan. *sippe*, a woman affectedly coy: Low Ger. *sipp*, a word expressive of affected pronunciation]: to smile in a silly or affected manner; to put on an air of restraint and modesty in the manner of smiling: N. an affected smile; a smirk. SIM'PERING, imp.: ADJ. smiling in an affected manner: N. act of one who simpers. SIM'PERED, pp. *-pėrd.* SIM'PERER, n. *-ėr*, one who simpers. SIM'PERINGLY, ad. *-lĭ.*

SIMPLE, a. *sĭm'pl* [F. *simple*, simple—from L. *simplex* or *simplĭcem*, plain, unmixed—from a root *sim*, appearing in L. *semel*, once; *plico*, I fold: It. *simplice*]: consisting of one thing; not combined; not compounded; not complicated; elementary; artless; harmless; inartificial; true to nature; unadorned; silly; shallow; in *bot.*, not branching; not divided into separate parts, as *simple fruits*, those formed by one flower: N. something not mixed or compounded; in *med.*, a single herb or plant, possessing a particular virtue. SIM'PLY, ad. *-plĭ*, in a simple manner; without art; plainly; of itself; merely. SIM'PLENESS, n. *-pl-nĕs*, the state or quality of being simple. SIM'PLETON, n. *-tŏn*, a person of weak intellect; a silly person. SIMPLICITY, n. *sĭm-plĭs'ĭ-tĭ*, state of being unmixed or uncompounded; reliance on natural grace; artlessness of mind; freedom from duplicity; plainness; silliness. SIMPLE-HEARTED, a. single-hearted; guileless. SIMPLE-MINDED, a. artless; undesigning. SIMPLE-MINDEDNESS, n. artlessness. SIMPLE EQUATION, in *alg.*, an equation which contains the unknown quantity in the first degree.—SYN. of 'simple, a.': single; uncompounded; unmingled; unmixed; plain; artless; sincere; elementary; mere; uncombined; undesigning; harmless; open; unaffected; frank; unadorned; credulous; foolish; silly; shallow; unwise; inartificial.

SIMPLE CONTRACT: any contract constituted by word of mouth or by a writing not under seal, nor of record: see CONTRACT.

SIMPLIFY, v. *sĭm'plĭ-fī* [F. *simplifier*, to simplify—from L. *simplex* or *simplĭcem*, plain, unmixed; *facĭō*, I make]: to make plain or easy; to render less complex or difficult. Sim'plifying, in. Sim'plified, pp. *-fīd.* Sim'plifica'tion, n. *-fĭ-kā'shŭn* [F.—L.]: the act of simplifying or making simple.

SIMPLON, *sĭm'plŏn* (It. *Sempione*): famous mountain of Switzerland, one of the Lepontine Alps, in the e. of the canton of Valais, near the Piedmontese frontier; height 11,124 ft. The *Simplon Road*, one of the greatest engineering achievements of modern times, leads over a shoulder of this mountain (the *Pass of the Simplon*, height 6,592 ft.) from Brieg in Valais to Domo d'Ossola in n. Piedmont. The road was commenced 1800 under the direction of Napoleon, and was completed 1806. It is 25 to 30 ft. broad, and has nowhere a slope greater than 1 in 13. It is carried across 611 bridges, over numerous galleries cut out of the natural rock, or built of solid masonry, and through great tunnels. Close to the highest point is the *New Hospice*, one of the 20 edifices on this route for shelter of travellers.

SIMPSON, *sĭmp'son*, Sir James Young, m.d.: 1811–1870, May 6; b. Bathgate, Linlithgowshire, Scotland. In his studies at the Univ. of Edinburgh, he inspired his teachers with an interest in his future. He graduated in medicine 1832; and Prof. Thomson chose him as assistant, and employed him in preparation of his course of lectures on general pathology. He began professional practice on his own account; and 1840 succeeded Hamilton as prof. of midwifery in the Univ. of Edinburgh, in which position, by the rigidly scientific, while popularly attractive, character of his prelections, he contributed greatly to the renown of the Edinburgh school. His two vols. of Obstetric Memoirs contain the fruits of patient and ingenious research. He is remembered particularly for his discovery of the anæsthetic virtues of chloroform. The so-called sulphuric ether had been employed in America by Morton to produce anæsthesia during parturition; but S. introduced 1847 the far safer and more certain agency of chloroform. Surgical practice owes to him also the stoppage of hemorrhage by Acupressure (q.v.). He made valuable contributions to antiquarian research. He read many papers and notices before the Royal and Antiquarian Societies of Edinburgh. His scientific services were recognized by innumerable medical associations; and his professional distinction secured for him a baronetcy 1866. A statue of S. was erected in Edinburgh 1877. See Memoir by Duns (1873).

SIMP'SON, Josiah: 1815, Feb. 27—1874, Mar. 3; b. New Brunswick, N. J.: surgeon. He graduated at Princeton 1833, and from the med. dept. of the Univ. of Pennsylvania 1836. He served as asst. surgeon in the U. S. army in the Florida and Mexican wars, being present at the battles of Okeechobee, Vera Cruz, Cerro Gordo, Churubusco, and Chapultepec. His headquarters were at New York 1848–55, when he was promoted surgeon;

served as med. director of the dept. of the Pacific 1855–58; of the middle dept. 1862–66; and of the dept. of the Tennessee 1866, till he was transferred to Baltimore 1867, where he died.

SIMPSON, Matthew, d.d., ll.d.: pulpit orator and Meth. Episc. bishop: 1811, June 20—1884, June 18; b. Cadiz, O. He was educated at Madison Coll., since united with Allegheny Coll., at Meadville, Penn. Entering on the profession of medicine at 22 years of age, he soon abandoned it for the Christian ministry, 1834, becoming a circuit preacher in O.; the next year residing at Pittsburgh, and 1837 at Williamsport, when he was chosen prof. of nat. science in Allegheny Coll. Two years later he was elected to the presidency of De Pauw (then Asbury) Univ., at Greencastle, Ind., where he served nine years. His success in government, and in advancing the financial interests of the univ., was notable. In 1852 he was elected bp., and 1857 he went abroad as delegate to the Wesleyan conference, and to the Evangelical Alliance at Berlin. His addresses and sermons before these bodies added to his wide fame as a speaker. Before returning, he travelled through the countries bordering on the e. Mediterranean. In 1859 he acted as pres. of the Garrett Biblical Institute at Evanston, Ill., and later removed to Philadelphia. His work and appointments required him to visit Europe 1870, 75, and 81, the last voyage to attend the Methodist Ecumenical Council in London, on which occasion he gave the opening discourse, also an address in Exeter Hall on the death of Pres. Garfield, immediately on receiving the news of the assassination. In 1874 he visited Mexico, where Meth. missions have been established. His reputation was high as an accomplished presiding officer, but chiefly as an unaffected, chaste, earnest, and eloquent speaker, preferred above all others by Pres. Lincoln, at whose funeral he officiated. He died at Philadelphia.—Among his works are: *A Hundred Years of Methodism* (1876); *Cyclopedia of Methodism* (1878); Yale *Lectures on Preaching* (1879). A posthumous volume of his *Sermons* was published by George R. Crooks, d.d. (1885).

SIMROCK, *sĭm'rok*, Karl: German poet and scholar, who has done more perhaps than any other man to make his countrymen familiar with their early literature: 1802, Aug. 28—1876, July 18; b. Bonn. He studied at the Univ. of Bonn, and afterward at Berlin; and 1823 entered the Prussian state service. His first work was a translation into modern German of the *Nibelungenlied* (Berl. 1827; 9th ed. Stuttg. and Tüb. 1854), followed by a translation of the songs admitted by Lachmann to be genuine, under the title *Zwanzig Lieder von den Nibelungen* (Bonn 1840). Soon after the publication of his translation of Hartmann von der Aue's *Armer Heinrich* (Berl. 1830), he was compelled to leave the Prussian service on account of a revolutionary poem which he wrote. Afterward he applied himself exclusively to literature, particularly to the early literature of his own country, which he modernized in splendid style. In 1850 he was appointed prof. of German language and literature at Bonn, a situation which he held till his death. His principal works besides those above mentioned are: *Quellen des Shakespeare in Novellen, Märchen, und Sagen* ('Sources of Shakespeare in Novels, Tales, and Legends,' 3 vols. Berl. 1831), executed in conjunction with Echtermeyer and Henschel, but of which the most important part was S.'s; *Novellenschatz der Italiener* (Berl. 1832); translation, with commentary, of the poems of Walther von der Vogelweide (2 vols. Berl. 1833), in conjunction with Wackernagel, and of *Wieland der Schmied. Deutsch Heldensage* (Bonn 1835), one of the freshest of the German mediæval epics; *Rheinsagen aus dem Munde des Volkes und Deutscher Dichter, für Schule, Haus, und Wanderschaft* ('Legends of the Rhine from the Mouth of the People and German Poets, for School, Home, and Travelling,' 4th ed. Bonn 1850, latest ed. 1857.; collection of German *Volksbücher* ('People's Books'), comprising national proverbs, songs, and riddles, besides a vast quantity of stories (these, carried on for several years, include many vols.); translation of Wolfram von Eschenbach's *Parzival und Titurel* (Stuttg. and Tüb. 1842); *Das Heldenbuch*, partly translations and partly original poems (1843–49). A separate collection of his own poems (*Gedichte*) was published at Leipzig (1844; new ed. 1863). Later productions are a translation of the Songs of the Edda (Stuttg. and Tüb. 1851, third ed. 1863); *Handbuch der Deutschen Mythologie* (2 vols. Bonn 1853–55; 2d ed. 1864); *Gedichte Shakespeares* (1867).

SIMS, *sĭmz*, CHARLES N., D.D., LL.D.: born Union co., Ill., 1835, May 18. He graduated from Indiana Asbury (now De Pauw) Univ. 1859; was pres. of Valparaiso Coll., Ind., 1860–63; in charge of Meth. Episc. churches at Wabash, Evansville, and Indianapolis, Ind., Baltimore, Md., Newark, N. J., and Brooklyn; and since 1880 has been chancellor of Syracuse Univ. He served as commissioner to the Onondaga Indians 1882–3; and was a delegate to the Meth. Episc. gen. conf. 1884 and 88. He has contributed to periodicals, and pub. *Life of Thomas M. Eddy* (1879).

SIMS, JAMES MARION, M.D.: surgeon: 1813, Jan. 25—1883, Nov. 13; b. Lancaster co., S. C. Having graduated at the S. C. College, he began the study of medicine 1832, and received the degree M.D. from the Jefferson Med. Coll. of Philadelphia 1835. He practiced his profession first in his native county, then in Ala.; he was settled in Montgomery 1840–53, during which time he achieved great distinction as a surgeon by his successful operations for strabismus and for club-foot, but particularly by his discovery of the cause and proper treatmentof the lock-jaw of infants, and his invention of the silver suture for use in treating vesico-vaginal fistula, and of the 'Sims speculum.' With health dangerously impaired by chronic diarrhea of three years' standing, S. removed to New York 1853. In the face of determined opposition from the medical profession, he opened a hospital for treatment of women's diseases in New York 1855: an appropriation of $50,000 was made by the legislature 1857 for erection of a suitable building. S. visited Europe 1861, and again

1862, when he decided to commence practice in Paris. He was settled in London 1864–68, and then returned to New York. In the Franco-German war S. was surgeon-in-chief of the Anglo-American ambulance corps, organized by him at Paris. Returning to New York, he was appointed a member of the board of surgeons of the Woman's Hospital. He was author of many contributions to medical journals, and pub. *The Story of My Life* 1884.

SIMSON, *sĭm'son,* Robert, m.d.: Scotch mathematician: 1687, Oct.—1768, Oct. 1; b. Kirktonhill, in Ayrshire. He was educated at the Univ. of Glasgow with a view to the clerical profession, and attained great eminence in classical and mathematical knowledge. His taste for mathematics gradually gained ascendency, and all other pursuits were abandoned. He was appointed prof. of mathematics in Glasgow 1711; and served for 50 years. S.'s reputation rests chiefly on his 'restorations,' more properly 'reconstructions,' of the Greek geometers. Some good judges are of opinion that he has corrected many errors in the original text, though his respect for the Greek mathematicians always led him to refer these to the ignorance of editors and the negligence of copyists. His first success in this direction was to discover the signification of Euclid's porisms, the only datum being a most obscure and tantalizing description of them by Pappus, whose indefiniteness had foiled Fermat and Halley. A similar success, on the 'loci plani' and the 'sectio determinata' of Apollonius, stamped him as one of the most elegant geometers of modern times. His correction of Euclid's *Elements,* pub. 1758, has been frequently re-edited and republished as a school-book, especially the ed. by Playfair. An edition of Pappus, discovered after S.'s death, was presented to the Univ. of Oxford.

SIMULACRUM, n. *sĭm'ū-lā'krŭm,* Sim'ula'cra, n. plu. *-kră* [L. *simŭlācrum,* an image—from *simŭlo,* I represent—from *simĭlĭs,* like]: a form or image of an object of sense or thought presented to the mind; a shade or phantom as seen in a mirror or a dream.

SIMULAR, a. *sĭm'ū-lėr* [F. *simuler,* to feign—from L. *simulārĕ,* to represent—from *simĭlĭs,* like]: in *OE.,* counterfeit; plausible: N. one who counterfeits.

SIMULATE, v. *sĭm'ū-lāt* [L. *simulātus,* imitated, pretended; *simulārĕ,* to imitate—from *simĭlĭs,* like: It. *simulare:* F. *simuler*]: to assume the appearance of without the reality; to feign; to pretend: Adj. feigned; pretended. Sim'ulating, imp. Sim'ulated, pp.: Adj. pretended; feigned. Sim'ulator, n. *-tėr,* one who feigns. Sim'ula'tion, n. *-lā'shŭn* [F.—L.]: the act of assuming to be that which one is not.—Syn. of 'simulate, v.': to feign; pretend; assume; counterfeit.

SIMULTANEOUS, a. *sī'mŭl-tā'nĕ-ŭs* or *sĭm'ŭl-* [L. *simul,* together, at once: It. *simultaneo;* F. *simultané,* simultaneous]: existing or happening at the same time. Si'multa'neously, ad. *-lĭ.* Si'multa'neousness, n. *-nĕs,* the state or quality of being simultaneous.

SIN, ad. *sĭn:* OE. for Since.

SIN, n. *sĭn* [Ger. *sünde;* Dan. and Sw. *synd;* AS. *syn;* Icel. *synd,* sin—the radical meaning being probably 'breach': Norw. *synd,* sin, breach of right: L. *sons,* hurtful, guilty]: any action, word, or thought contrary to the law of God; the habitual neglect of religion; transgression; the omission of duty; a wicked act; in *Shak.*, a man enormously wicked: v. to violate any law of God; to do wrong. Sin'ning, imp. Sinned, pp. *sĭnd.* Sinner, n. *sĭn'nėr,* one who disobeys any divine law or precept; an unregenerate person; an offender. Sin'ful, a. *-fûl,* wicked; unholy; contrary to the laws of God. Sin'fully, ad. *-lĭ.* Sin'fulness, n. *-nĕs,* wickedness; depravity. Sin'less, a. *-lĕs,* free from sin; innocent. Sin'lessly, ad. *-lĭ.* Sin'lessness, n. *-nĕs,* freedom from sin or guilt. Sin-born, a. derived from sin. Sin-offering, the sacrifice offered under the Mosaic law, as an expiation for the sin of the people, considered different from the *trespass-offering,* which is thought to have been appointed for special cases of sin. Actual sin, in *theol.*, the violation of a known rule of duty. Deadly or Mortal sins, in the *Rom. Cath. Chh.*, the seven sins of murder, lust, covetousness, gluttony, pride, envy, and idleness, which take away sanctifying grace. Venial sins (q.v.), in *Rom. Cath. Chh.*, those sins which weaken sanctifying grace, but do not take it away, and which it is not necessary though commendable to mention in confession. Original sin, in *theol.*, the native depravity of the heart; the corruption of man's whole nature, resulting from Adam's transgression.—Syn. of 'sin, n.': crime; offense; transgression; trespass; iniquity; wrong; vice; guilt; misdemeanor; misdeed; injury; wickedness; injustice.—*Sin* is a term applied by theologians to the moral defect or perversion of human nature, which appears an inherent quality of the human will, and, in a greater or less degree certainly, characterizes it in this life. It is something more than natural evil, i.e., the evil which is affirmed of the external world or of the lower creation. *Evil,* as denoting decay or corruption in nature is admittedly a mere relative term; for in truth decay is as normal a process in creation as renovation, and corruption is the condition of restored health and beauty. In a similar manner, evil such as it exists in the lower animal creation, in the form of *prey* and in the forms of pain, of sickness, and of death—whatever be the special view taken of such phenomena—is never reckoned evil in the sense of *Sin,* i.e., *moral* evil. In order to constitute the special idea of sin, it is always necessary to suppose a moral element in the evil to which it is applied. Whatever form of evil is independent of the human will as its source, origin or agent, is not sin. Theologians, indeed, speak of *original sin,* or the sin of human nature, as distinguished from *actual sin,* or the particular transgression of the individuals composing mankind. According to a common theological theory, men are not only sinners individually, but they are partakers of a sinful nature, with which their will has had nothing to do—with reference to which they have had no choice of good or evil: the evil has come to them by natural descent from the original parents of the race. But even the most extreme view of original sin preserves a hypothetical relation between every individual will and the primal transgression which it considers to be sin, not merely in those who committed it, but in those who have descended from them. All mankind are supposed to have really existed in Adam, the first sinner, who thus was literally their representative, so that 'they sinned in him and fell with him in his first transgression.' Without such a hypothesis of unity between Adam and his race, so that his will was in some measure the typical or representative will of the race, the notion of original sin could not be maintained. For the relation between sin and will as a moral power, having the choice of good and evil, is a cardinal relation without which it would seem impossible to distinguish sin as a quality from other forms of evil in the world.

SINAI, *sī'nā* or *sī'nā-ī:* mount on which, according to the Pentateuch, God announced to Moses the ten commandments and the other laws by which the Israelites were to be bound. Its exact position is matter of dispute, but it is to be sought for in the mass of granite and porphyry mountains occupying the greater part of the Arabian peninsula, between the Gulf of Suez and Akabah, and rising 8,000 or 9,000 ft. above sea-level. This mountain-mass is divisible into three groups: a n.w., reaching in Mount Serbal an elevation of 6,340 ft.; an e. and central, attaining in Jebel Katherin 8,160 ft., and a s.e., whose highest peak, Um Shaumer, is the culminating point of the whole Sinaitic range. Serbal, with its five peaks, appears the most magnificent mountain in the peninsula, and is identified with S. by the earlier church Fathers, Eusebius, Jerome, Cosmas, etc.; but it does not meet the requirements of the Hebrew narrative, and even as early as the time of Justinian, the opinion that Serbal was the S. of Moses had been abandoned, and to a ridge of the second or e. range that honor had been transferred, the n. summit of which is termed Horeb: its s. summit, Jebel-Mûsa or Mount of Moses, continues to be regarded as the true S. by the great majority of those scholars who look for any precise identification of some individual summit as the Mountain of the Law. Its height is variously estimated 6,800 to 7,100 ft. above sea-level.

At the e. base of Jebel-Mûsa, in the ravine of Shouaib, stands in solitary peace the famous monastery of Mt. S.; but in earlier times the mountain had numerous other convents, chapels, and hermitages.

SINAITIC, a. *sī'nā-ĭt'ĭk* or *si-nĭt'ĭk:* pertaining to Mount Sinai; made or given there, as the Mosaic law.

SINAITIC CODEX, *sī-nā-ĭt'ĭk kō'dĕks:* one of the two most ancient Greek manuscripts of the N. Test. and part of the Old, and the Apocrypha. It is numbered by the Hebrew letter א (as the reputedly older MS., the *Vatican*, is by the letter B); and is named from Mount Sinai, where it was discovered by Tischendorf in the convent of St. Catherine 1844, when he brought away 43 of the 345½ leaves. On another journey thither 1859, he persuaded the monks to make a gift of the remainder to the czar. It is the great treasure of the imperial library at St. Petersburg, which contains no less than 26,000 codices. Of the leaves, nearly 200 are of the Old Test., Septuagint version, and contain I Chron. ix. 27—xi. 22; Tobet ii. 2 to the end; Judith i. 1—xi. 13; xiii. 9—xvi; I Macc.; IV Macc.; Isaiah; Jer. i. 1—x. 25; Joel; Obadiah; Jonah; Nahum; Habakkuk; Zephaniah; Haggai; Zechariah; Malachi; Psalms; Proverbs; Canticles; Wisdom of Solomon; Ecclesiastes; and Job. The N. Test. is entire, and appended to it are the Epistle of Barnabas and parts of the Shepherd of Hermas, now included in the apochryphal N. Test. writings. The style of uncial letters and other characteristics of the MS. indicate that it is even older than the Vatican codex, and the question was whether it is a somewhat later copy of an older text. In many respects it singularly corresponds with the Vatican codex, such as the style of inscription and subscription letters of each book, 'the absence of the Ammonian sections and the Eusebian canons, the nature of the readings,' etc. Tischendorf referred it to the middle of the 4th c., to which also the Vatican MS. belongs. It exhibits the usual slight errors manifestly due to copying from dictation. Tischendorf published full notes on it 1860, and more briefly as an accompaniment of the 7th ed. of his N. Test. In all he furnished 600 Sinaitic readings for the whole N. Test. But, as usual with the most ancient codices, the variations have few important bearings on the sense, much less affect seriously any doctrine or statement of fact. Take any chapter at random, e.g. Matt. vi.: verse 1 in the Sinaitic prefixes 'but,' and has 'righteousness' instead of 'alms;' verse 2 repeats 'verily;' verse 4 omits 'openly;' verse 5 has 'ye' for 'they;' verse 8 has 'God' for 'Father;' verse 12 has 'as we have forgiven' instead of 'as we forgive;' verse 13, as in the Vatican MS., omits 'for thine is the kingdom,' etc.; verse 15 omits 'their trespasses,' and has 'the' instead of 'your' before 'Father;' verse 16 omits 'the' before 'hypocrites,' and has 'face' instead of 'faces,' etc.—The Sinaitic agrees with the Vatican text in omitting the account of the woman taken in adultery, also in not having the last 12 verses of the received text of St. Mark's Gospel. This last bears on the date of the MS., since Eusebius (d. 340) and Jerome said that in nearly all trustworthy copies that Gospel ends with chap. xvi. 8; and it so ends only in these two existing codices. So also Basil the Great (d. 379) states that 'Ephesus' is wanting in Eph. i. 1, in the old MSS. of his day; and such is the fact in these two. There are other data of the same kind; and the two alone have initial letters of the same size and sort as other letters, and in this agree with the Herculanean MSS. and disagree with the Alexandrine codex of the 6th c. Tischendorf thinks it probable that the Sinaitic codex is one of the 50 copies which Constantine in 331 directed to be made at Byzantium, under the care of Eusebius of Cæsarea, and that it was sent to Sinai by Emperor Justinian, founder of the convent. 300 copies of the entire codex were published by the czar Alexander II., with exactness and magnificence, 1862, the year following his emancipation of the serfs. The N. Test. portion was issued in a portable form 1863 and 65. Tischendorf's English N. Test., with a page of fac-similes and foot-notes from the three oldest codices, was made the thousandth volume of the Tauchnitz series, 1869. In the preface he says 'Providence has ordained for the New Testament more sources of the greatest antiquity than are possessed by all the old Greek literature put together.'

SINALO'A: see CINALOA.

SINAPISINE, n. *sĭn'ă-pĭ'sĭn* [L. and Gr. *sināpī*, mustard]: peculiar principle found in the seed of white mustard. SIN'APISM, n. *-pĭzm*, a mustard-poultice. SINAPOLINE, n. *sĭn-ăp'ō-lĭn*, substance ground from oil of mustard. SINAPIS: see MUSTARD.

SINCE, conj. *sĭns* [AS. *sith*, after, later: Scot. *syne*, since: Icel. *síd*, *sídar*, late, later; *senn*, slow, late: Ger. *seit*, since]: because that; from the time when: AD. ago; past; before this: PREP. after; reckoning from; from the time of.—SYN. of 'since, conj.': because; for; as; inasmuch as; considering.

SINCERE, a. *sĭn-sēr'* [F. *sincère*—from L. *sincērus*, pure, entire: It. *sincero*]: unfeigned; being in reality what it appears to be; true; genuine; real; in *OE.*, unhurt; uninjured. SINCERE'LY, ad. *-lĭ*. SINCERE'NESS, n. *-nĕs*, or SINCER'ITY, n. *-sĕr'ĭ-tĭ*, honesty of mind or intention; freedom from hypocrisy or false pretense; genuineness; truthfulness.—SYN. of 'sincere': honest; undissembling; uncorrupt; hearty; unfeigned; real; true; unvarnished; unaffected; inartificial; upright; frank.

SINCERE BRETHREN, or TRUE FRIENDS: semi-religious, semi-scientific Mohammedan order, whose beginnings are obscure, but which, about A.D. 970, manifested its existence by one of the boldest and most comprehensive literary undertakings—an encyclopedic treatment of philosophy, theology, science, ethics, and metaphysics, in a series of 51 treatises. See MOHAMMEDAN SECTS, especially MOTAZILITES, for notice of that immense religious struggle that arose but a few generations after Mohammed, in the bosom of Islam, bringing forth sect after sect; and which, under whatever name, simply denoted the reaction of the thinking minds against the dead weight of dogma and formula which the successors of the Prophet tried in his name to impose on the Faithful. What the Motazilites had attempted was the reconciliation of scientific speculation, as it had irresistibly grown up at the first contact of the Arabs with Greek literature, with the religious dogma of Islam. This new development of Arabic culture, which chiefly characterizes the epoch of the first Abbaside rulers, was of brief duration. The representatives of the 'orthodox' schools, insisting on the most literal interpretation, used the same weapons of dialectics which their adversaries had taught them to wield. They soon built up a scholastic edifice of theology, not easy to be attacked without direct outspokenness; and from this the new schools, with the terror of the caliphate strong upon them, shrank. Thus the Motazilites soon disappeared from the arena. But their labors had not been in vain. Silently and by degrees this mysterious union of the S. B. arose. Though widely spread, their schools, their houses of assembly, their rules, their doctrines, everything. remained, we know not how long, a profound mystery; and apart from that which they themselves have revealed, neither ancient nor modern investigation has discovered many traces of their inner organization and activity. Not even many of their names have come down to us, though the 'treatises' that they have left point to a multitude of authors and to many stages of development. The tone of these treatises is much more free, and their entire tendency more radical than that of any of the books of their predecessors. Yet, the desire not to offend the less advanced in religious matters, and above all, to reunite rather than to make the breach wider, is perceptible in their endeavor to use, or rather abuse, what Koranic quotations and traditions could be pressed into the service of free thought by often unnatural processes of allegory and mysticism.

It is known that in their houses of assembly at those 'stated periods,' at which no stranger was to be admitted, the principal conversation was on the knowledge of the soul or psychology, the knowledge of the action of the senses and the things perceptible through them, the contemplation and investigation of the mysteries of the sacred books, and the prophetical revelations, and the ideas contained in the divine laws. The attention of the S. B. was further to be directed to the four 'mathematical' sciences—arithmetic, geometry, astronomy, and (musical) composition. But their chief subject was to be the knowledge of divine things. The most catholic spirit was to prevail regarding the various sciences, systems, or books; since 'our own system comprises all, without exception, and includes all science.' 'The speculations of our school extend simply to all things—the sensual and the intellectual—from the moment of their beginning to their end, according to their outer and inner life—that which is palpable and clear about them, and that which is hidden and secret—the Truth, in fact. For the true essence in everything is derived from one primeval origin and general cause, since there is but one world and one supreme mind, to which all the most manifold phenomena, species and kinds, and divisions, are to be traced back.'

All their knowledge they traced back to four sources—

a number which played a considerable part in all their divisions: 1. 'The books that are known by the names of the sages and philosophers,' i.e., the translations of Greek works of Pythagoras, Aristotle, Euclid, Ptolemy, Porphyry, etc. 2. 'The revealed writings derived from the prophets,' e.g. the five Books of Moses, the Gospel, the Psalms, the Koran, and other writings of prophets who had received their contents through inspiration by the angels. 3. 'Books treating of nature'—i.e., of the celestial circles, motions of the stars, transformation of matter, species and kinds of animals, plants, etc. 4. 'The divine books, written by the angels from the tablet of Fate, on which all the divine decrees regarding the world and man are inscribed. These contain all that refers to substances, species, kinds, and orders of the different souls; their actions, destinies, metamorphoses, phase after phase, the heavenly conjunctures and periods, etc.'

The encyclopedia of treatises, the monument of this secret association, was compiled first at Basrah about 1000; but has (except one often reproduced chapter, 'The Contest between Man and Animal') never been printed.

Great interest attaches to this production, as the earliest encyclopedia deserving the name, reflecting, as it does, the state of science both of the East and of the West at the end of the first thousand years after the introduction of Christianity. The 51 treatises are defective in system and often fail to be instructive in details; yet they belong to the most comprehensive efforts of the human mind. The chief cause of the discontent which these treatises excited among contemporaries lay in their conciliatory tendencies, for which Mohammedan theology had neither use nor place.

On this subject what fragmentary information we possess lies scattered in Oriental 'Transactions,' in notes, and in prefaces.—See Sprenger, in *Asiatic Journal* of Bengal; Flügel. in *Deutsche Morgenl. Zeitschrift;* De Sacy, *Notices et Extraits;* Dieterici, *Mensch und Thier;* Nauwerck; etc.

SINCIPUT, n. *sĭn'sĭ-pŭt* [L. *sincĭput,* the forepart of the head—from L. *semi,* half; *caput,* the head]: the fore part of the head; opposite of *occiput,* back part of the head.

SINCLAIR, *sĭn'klär*, Family of: Scottish historical house of Norman descent, the surname Sinclair or St. Clair (Latinized *De Sancto Claro*) being doubtless derived from possessions in Normandy. Two families bearing this surname, whose connection cannot now be traced, the St. Clairs of Rosslyn and of Herdmanston, appear in Mid-Lothian and E. Lothian in the beginning of the 12th c. Henry St Clair, *Vicecomes* of Richard Morville, Chancellor of Scotland, obtained, in 1162, a charter of the lands of Herdmanston, which have continued in the family. The ancestor of the other line was William St. Clair, who had Rosslyn confirmed to him by charter from David I. His descendant was, like his contemporary of the Herdmanston line, a companion-in-arms of Robert I. With the Douglas, he fell in battle against the Moors 1330.

But the fortunes and importance of the family were due principally to the marriage of the son of this Sir William with the daughter of Malise, Earl of Strathearn, Caithness, and Orkney, and heiress of the Norwegian Jarls of the Orkneys. In this way the St. Clair family acquired the Earldom of Orkney, but under fealty to the king of Norway; the Orkney earldom was, however, confirmed to him by Robert II.; and for the next two generations the power of the family was little less than princely, the St. Clair influence being further increased by intermarriages with near relatives of the royal house of Scotland. William, the third earl, held the high offices of lord admiral, lord justice-general, lord chancellor, and lord warden of the three Marches. He was made Earl of Caithness 1450. At his castle of Rosslyn he kept almost regal state and pomp His daughter was given in marriage to Alexander, Duke of Albany, son of James II. The earl, instead of keeping his great possessions united, partitioned them among his three sons in such a way as contributed to reduce the family influence. On William, his eldest son, he bestowed merely the lands of Newburgh, in Aberdeenshire; on his second, Sir Oliver, he settled all his estates south of the Tay; while, with consent of the crown, he conveyed the earldom of Caithness to his youngest son, also named William. The earldom of Orkney he had resigned into the hands of James III., receiving therefor lands in Fifeshire and elsewhere.

Lords Sinclair.—The eldest son of this last Earl of Orkney was still Lord S.; and on his death, on the field of Flodden, he was succeeded by a line of Lords S., who ranked among the more considerable of the Scottish nobility. His grandson, by a daughter, was the notorious Earl of Bothwell, third husband of Queen Mary, and whom, in memory of his maternal descent, that unhappy queen created Duke of Orkney. The seventh Lord S. had no male issue, but a daughter, married to St. Clair of Herdmanston, representive of the other house of Sinclair above alluded to. The son of this marriage, in virtue of a new patent obtained from Charles II., became eighth Lord S. —this patent, singularly, bringing in, on failure of heirs male, his paternal relatives, the St. Clairs of Herdmanston, strangers in blood to the former Lords S.

Earls of Rosslyn.—Rosslyn had been purchased from Sir Oliver S. by one of the sons of the eighth Lord S.; and the title with the estates both of Rosslyn and of Dysart, went to the issue of the eighth lord's second daughter, whose grandson, Sir James Erskine of Alva, succeeded to the earldom of Rosslyn.

Sinclairs of Rosslyn.—Sir Oliver S., the above-mentioned second son of the last Earl of Orkney, was progenitor of a line of barons who, for two centuries, owned the splendid domains of Rosslyn, and were buried in the vault of the chapel, in royal fashion, in their armor. Sir Oliver's second son was the noted Oliver S., favorite of James V., whom, to the general disgust, he placed in command of the army sent to encounter the English 1542. To the repugnance of the army to serve under him, is attributed the disgraceful rout of Solway Moss, where 10,000 Scottish troops fled at the sight of 300 English cavalry, to whom they can hardly be said to have made any resistance. The last of Sir Oliver's line, impoverished by the political troubles in which his support of the Stewarts had involved him, sold Rosslyn, which then became, as above noted, the property of the disinherited elder branch.

Earls of Caithness.—This title was, as above noted, conferred on William S., youngest son of the last Earl of Orkney, and has been since held by his descendants in one branch or another. The third earl, ambitious enough to aspire to be an independent prince, endeavored, 1529, by force of arms, to recover the Orkneys from the crown; but lost his life in this conflict. The Sinclairs of Ulbster are sprung from a legitimated son of William S., second son to the fourth Earl of Caithness. See Sinclair, Sir John.

SIN'CLAIR, Sir John, Bart.: Scottish agricultural improver, patriot, and author: 1754, May 10—1835, Dec. 21; b. at Thurso Castle. He represented the Sinclairs of Ulbster, branch of the noble House of Caithness. After studying at Oxford Univ. he was admitted to the Scottish and English bars; but soon turned to the pursuits of public life. From 1780 he represented his native county in parliament for many years. He wrote pamphlets on public affairs—on the navy, the militia force, the national finances, etc. In 1784 he published a *History of the Revenue of the British Empire*, an elaborate work in two 4to vols.; 1786 he was created a baronet. He established agricultural societies which were of great benefit to the country. Sir John's most important undertaking was the *Statistical Account of Scotland*, completed after seven years' labor in 1798 (20 large vols.), and comprising a description of every parish in Scotland. Sir John wrote on all manner of topics; and his publications during 50 years are said to number 367. As financier and political economist he was consulted by Pitt. He raised for public defense 1794 a regt., and 1795 a battalion—each of a thousand men. He died at Edinburgh.—**Catherine S.** (1800–64), fourth daughter of the baronet, was author of tales and descriptive works—*Modern Accomplishments, Modern Society, Scotland and the Scotch, Shetland and the Shetlanders*, etc.

SIND, or SINDE, or SCINDE, *sĭnd :* extensive province in the extreme w. of Brit. India; bounded n. by Beloochistan and the Punjab, e. by Rajputana, w. by Beloochistan, s. by the Arabian Sea and the Great Western Runn, extensive lacustrine inlet which separates S. from Cutch; 380 m. in greatest length, 280 in greatest breadth, 47,066 Eng. sq. m. (besides a tributary area). The sea-coast, which extends n.w. 150 m., is very low and flat except the small portion beyond Karatchi (Kurrachi), and is studded here and there with low mud-banks formed by the Indus, or with sand-hills, the accumulated drift from the beach: it is overflowed at high tide to a considerable distance inland, and is hardly visible, according to Burnes, at a league from shore. The province is traversed through its whole length by the Indus (q.v.), which, approaching the coast, divides and subdivides into a number of channels, forming a delta 75 m. in length; 130 in breadth. This delta, unlike that of the Ganges, is almost destitute of wood, and the soil consists of a mixture of clay, sand, and vegetable mold, which is speedily baked hard by the heat. Along each bank of the Indus is an alluvial tract of great fertility, extending 2 to 12 m. from the river, and mostly irrigated by artificial canals and water-courses, which, overflowing during the inundations, cover the soil with a silt so rich as to yield two, sometimes three, crops in a year. The soil, nevertheless, contains in the n. so much saltpetre, and in the s. so much salt, that after the year's crops have been obtained, these substances are extracted for home consumption and export. Between the Indus and its most easterly branch, the Narra, is an alluvial 'doab,' averaging 75 m. in width, but which, from lack of irrigation, has become almost a desert. East of this, on the other side of the Narra, is the *Thur*, a desert of shifting sand. W. of the Indus the country is occupied by the desert of Shikarpur on the n., a desert not of sand but of alluvial clay, the same as that of the delta, which requires only irrigation to render it fertile; and in the s. it is traversed by the Hala Mts. The *Thur*, or e. desert, has numerous vestiges of former towns—heaps of fragments of bricks and pottery. The climate of S. is remarkably sultry and dry, it being completely beyond the action of the s.w. monsoon; at Haidarabad, the fall of rain in one year was 2½ inches; the average annual fall at Karatchi does not exceed 6–8 inches, and Larkhana has been known to be without rain three years in succession; the average maximum heat for six months at Haidarabad was 98·5° in the shade, and is still greater in Upper Sind. There are generally two harvests annually; the first, or *rubbî* (spring) harvest, consists of wheat, barley, oil-seeds, millet, durra, opium, hemp, and tobacco; the second, or *kurîf* (autumn) harvest, of those crops whose ripening requires much heat, as rice, sugar-cane, cotton, indigo, maize. The pop. is a mixture of Juts (a Hindu race) and Beluchis, with a few Afghans in the n.w.; the greater portion are Mohammedans, and the remainder, who profess Hinduism, have fallen far from the usual strictness of observance. Generally, the Sindians are tall and handsome; the Beluchi portion warlike and independent; the Juts peaceable and agricultural.

From the time (711) that S. was conquered by the caliph, Abd-ul-Melek, it underwent numerous vicissitudes, forming at times a part of the empire of Delhi, and being latterly (1756) joined to Afghanistan. In 1779, the Beluchis rebelled, deposed their ruler, defeated the Afghans (1786), and raised their leader, chief of the Talpûr tribe, to supreme power. This chief made large grants of territory to various of his relatives, reserving most of Lower S. for himself and his three brothers; so that there were four 'ameers' at Haidarabad, three at Khyerpûr, and one or two at Mirpur. The ameers of S. always regarded the Brit. govt. with suspicion, and occasionally troubled those traders who visited their dominions; but they subsequently concluded and punctually observed commercial treaties. On the outbreak of the Afghan war 1838, the Brit. govt. intimated its intention to take temporary possession of Shikarpûr, and forced the ameers of Haidarabad and Mirpur to agree to a treaty which virtually destroyed their independence. Their expression of natural dislike at this treatment provoked fresh demands from the Calcutta govt., to which the Haidarabad ameers agreed, despite the clamors and threats of their followers, who attacked the Brit. residency on the following day. Sir Charles James Napier, Brit. envoy, at the head of a considerable military force, then marched against the enemy, totally routed them at Meeanee, 1843, Feb. 17; and by defeating the ameers of Mirpur, at Dubba, near Haidarabad (Mar. 24), completed the subjugation of Sind. The conquered territory was divided into three collectorates—Haidarabad, Karatchi, and Shikarpûr; the ameer of Khyerpûr, having continued faithful to the British, retained his dominions. For two years afterward Napier was actively employed in reducing the marauding tribes of the w., who pillaged the province; and so successful was the 'Sheitanka bhai' (Devil's Brother), as the robber tribes named him, that they were completely rooted out of their fastnesses, and most of them transported to distant regions The country is reported as rapidly improving under its present administration.—Pop. (1891) 2,900,000; (1901) 3,210,910.

SINDHU, *sĭn-dô'* [from Skr. *syand*, which in its older form probably was *syandh*, to trickle or flow]: ancient name of the river Indus and the country along the Indus or Sindh.

SINDIA, *sĭn'dĭ-a:* powerful family of Mahratta chiefs and princes, conspicuous in the history of India during the 18th and 19th c. The founder of the family was RANOJEE S., a Sudra of the Kûmbi ('cultivator') tribe, who from a menial station in the household of the Peishwa, rose to high rank in the body-guard, and after 1743. received in hereditary fief half of the extensive province Malwa.—His son MADHAJEE SINDIA (1750–94), on the death of Mulhar Rao Holkar (q.v.), became chief of the Mahratta princes, and had command of the Peishwa's body-guard; and 1770 the Peishwa and his two powerful feudatories. S. and Holkar, aided the emperor of Delhi in expelling the Sikhs from his territories, whose administration was given to S. He came into collision with the British; but the war (1779–82) which followed ended with the treaty of Salbye (1782), by which S. was recognized as a sovereign prince, and confirmed in his possessions. In 1784 he captured the stronghold of Gwalior, and in the following year marched on Delhi, to restore his preponderance in the councils of the puppet monarch, and subsequently seized Agra, Allyghur, and nearly the whole of the Doab (q.v.) The advantages of European discipline had impressed him during the war with the British, and, with the aid of a French officer, he introduced it into his own army of 18,000 regular and 6,000 irregular infantry, 2,000 irregular and 600 Persian horse, with 200 cannon. This force, under De Boigne, the officer above noticed, reduced Joudpore, Odeypore, and Jypore, three Rajpût states, and effectually humbled the pride of Holkar.—DOWLUT RAO SINDIA (1794–1827) continued his grand-uncle's policy, and ravaged Indore and Poona, but was routed 1802 by Jeswunt Rao Holkar. Having joined Bhonsla, Rajah of Berar, in a raid on the Nizam (1803), he brought upon himself the vengeance of the E. India Company; the confederated Mahrattas were routed at Assaye and Argaum by Sir Arthur Wellesley; S.'s disciplined troops, under French officers, were scattered irretrievably at Patpergunge (near Delhi) and at Laswari by Lord Lake; and he escaped total ruin only by acceding to a treaty by which all his possessions in the Doab and along the right bank of the Jumna were ceded to the British. Gwalior was, however, restored 1805, and became cap. of S.'s dominions. S. had been taught by his reverses a useful lesson; and he declined to join the attack (1817) on the Brit., and thus escaped the swift destruction which was visited on his turbulent neighbors.—During the reign of BHAGERUT RAO S., a minor, the Gwalior dominions were in such anarchy that the British were compelled to insist on certain guarantees for preservation of tranquillity: war followed the refusal of these, and the Mahrattas were routed at Maharajpûr 1843, Dec. 29, by Lord Gough, and at Puniaur by Maj.gen. Grey, on the same day. Gwalior fell into the hands of the Brit. 1844, Jan 4;

and S. submitted to the conditions demanded of him. In 1853, he was declared of age by the E. India Company; and 1858 he took the field at the head of his own army against the Gwalior contingent of sepoys, which had joined in the great sepoy mutiny. But the most of his troops deserted him during the battle (June 1), and he narrowly escaped by fleeing to Agra. S. was subsequently reinstated by Sir Hugh Rose, and received from the Brit. govt. numerous testimonials of its grateful respect. He is a knight grand cross of the order of the Bath.

SINE, n. *sīn* [L. *sinus*, a curved surface, a curve: It. *seno;* F. *sein*]: in *trig.*, a straight line drawn from one extremity of the arc of a circle perpendicular to the diameter passing through the other extremity; the *sine of an angle* of a right-angled triangle is the ratio of the opposite side to the hypothenuse. Sinical, a. *sĭn'ĭ-kăl*, pertaining to a sine. Versed sine, *vĕrst*, the segment of the diameter intercepted between the sine and the extremity of the arc.

SINE, *sī'nē* [L.]: a prefix signifying without. Sine die, *sī'nē dī'ē* [L. without a day]: without any specified day for reassembling, or for resuming the subject. Sine qua non, *kwā nŏn* [L., without, which, not]: a phrase used to signify any indispensable condition.

SINECURE, n. *sī'nĕ-kūr* [F. *sinécure*—from L. *sine*, without; *cura*, care]: in *canon law*, a benefice without cure of souls: in general, any office which has an income attached, but little or no employment. A S., in the canon law, is an Eng. ecclesiastical benefice, such as a chaplaincy, canonry, or chantry to which no spiritual function is attached, except reading prayers and singing, and where residence is not required. The strictest kind of S. is where the benefice is a donative, conferred by the patron expressly without cure of souls, the cure either not existing, or being committed to a vicar. Sinecure rectories have been abolished. Si'necur'ism, n. *-kūr'ĭzm*, the state of having a sinecure. Si'necurist, n. *-ĭst*, one who has a sinecure.

SINEW, n. *sĭn'ū* [AS. *sinu;* Dut. *zenuw;* Dan. *sene;* Ger. *sehne;* Icel. *sin*, a sinew]: that which unites a muscle to a bone; a Tendon (q.v.). Sinews, plu. *-ūz*, strength, or whatever gives strength; muscle; nerve: V. to bind by sinews; to strengthen. Sin'ewing, imp. Sin'ewed, pp. *-ūd:* Adj. strong; firm; vigorous. Sin'ewy, a. *-ū-ĭ*, consisting of sinews; strong; nervous; vigorous. Sin'ewiness, n. *-ĭ-nĕs*, the state or quality of being sinewy. Sin'ewless, a. *-lĕs*, having no strength or vigor.

SINFUL, SINFULNESS: see under Sin.

SING, v. *sĭng* [AS. *singan;* Ger. *singen*, to sing: Goth. *siggvan*, to sing, to read alone: Dan. *synge;* Sw. *sjunga*, to sing: Skr. *chinj*, to ring, to tingle: Icel. *sangra*, to murmur]: to utter musical or harmonious sounds (see Singing); to send forth sweet or melodious sounds, as birds; to chant; to celebrate in song or poetry; in *OE.*, to make a small or shrill noise. Sing'ing, imp.: Adj. uttering musical sounds: N. the utterance of musical sounds (see below). Sang. pt.

săng. SUNG, pp. *sŭng*. SING'ER, n. *-ėr*, one whose profession is to sing; one skilled in uttering musical sounds. SINGING-MASTER, n. one who teaches vocal music. SING-SONG, n. *sĭng'sŏng*, a drawling half-singing tone in speaking: ADJ. drawling.

SIN-GAN FOO', or SINGAN': see SE-GAN FOO.

SINGAPORE, *sĭng-ga-pōr':* one of the Straits Settlements (q.v.), belonging to Great Britain; consisting of an island off the s. extremity of the peninsula of Malacca, lat. about 1° 17' n., long. 103° 50' e.; and having a city of the same name on its s. side: it includes also more than 70 insignificant islets within a radius of 10 m. s. and w. The island is 27 m. long; 14 to 15 broad; 224 sq. m. It is separated from the mainland by a narrow but deep strait varying from a mile to a few furlongs in width. The surface is generally low and undulating, the greatest elevation (Bukit Tima, or the Hill of Tin) being only 520 ft. According to Malay accounts, a colony was planted on the site of the present town by tribes who are inferred to have been Javanese, from the circumstance that the name Singapura, which they gave to their settlement, is probably of Sanskrit origin (lion-town); the Javanese being the only people in these seas who have become fairly Hinduized. Be that as it may, in 1818 it was found by Sir Stamford Raffles an island covered with primeval forests, sheltering in its creeks and rivers only a few miserable fishermen and pirates. It seems to have been unclaimed by any power until 1811, when the sultan of Jahore formally annexed it to his territories. The commanding position of S., in the very centre of the highway from Brit. India to China, led Sir Stamford Raffles to mark it out as the site of the first free port in the Malayan seas; and 1819, the Brit. flag was hoisted on the new settlement; though it was not till 1824 that a satisfactory treaty was concluded with the sultan of Jahore, whereby the island of S., and all the islands within 10 m. of its shore, were given up in full sovereignty to the E. India Company, on condition of a considerable yearly payment. Since then, the prosperity of S. has been almost without parallel. Its position as an entrepôt for the trade of the Malayan Archipelago, the Eastern Peninsula, and China, and the wise policy that placed the commerce of the new port on an entirely unfettered footing, rapidly established a flourishing trade. Imports 1823 amounted to £1,200,000; exports £920,000. In the year ending 1865, Apr. 30, the value of imports was £6,610,000; exports, £6,630,000—double the amounts in 1854–5. Notwithstanding the opening of more direct communication with Europe of many of the markets in China, Cochin-China, and Siam, formerly largely supplied by traders from S., the commerce has increased; and 1880 the value of imports was £16,743,620; exports £15,610,347; both doubling within ten years. Exports to the United Kingdom 1880 amounted to £3,697,624; imports thence to S. £2,459,659. The chief articles of export to Europe and N. America are gambir, tin, sago, tapioca, black and white pepper, tortoise-shell, nutmegs, gutta-percha, camphor, coffee, sapan-wood, and rattans. Of these only gambir, sago, and nutmegs are produced on the island to any important extent; all the other articles being imported, chiefly by natives from other quarters. From Europe, large imports are received of cotton manufactures, woolens and linen, metals, hardware, earthenware, arms and ammunition, and treasure in the form of dollars. Large fleets of prahus are wafted by the southerly monsoon toward this great centre of trade, laden with the numerous products of the Indian Archipelago, to return laden with the manufactures of Europe. The splendid harbor of S. is well sheltered and of easy access; and as the converging point of the great trade-routes of the East, is visited by a large number of vessels. In 1889 the port was entered by 7,715 vessels of 6,114,000 tons. In 1901 the total imports were valued at $104,192.602; exports $98,040,059. In 1894 the imports from the United Kingdom were $27,852,362; exports to United Kingdom $32,759,488. A savings-bank was established 1877, now managed by a sec. immediately under the colonial treasurer. Education is steadily advancing, and a zealous desire on the part of the Eurasians to learn English is observable. There is a Malay college. S. is connected by rail with Krangi on the Johore Straits, and by telegraph with Madras, Java, Australia and Japan.

The currency of commerce is the Mexic. dollar; but the official currency of govt. is the rupee. The Chinese pecul, of 133⅓ lbs. avoirdupois, which is divided into 100 catties, is the standard of weight. The pop. is one of the most heterogeneous in the world, comprising at least 16 nationalities, speaking different tongues. The Malay, however, soft and easily acquired, is the recognized medium of communication between all classes. Of the aboriginal inhabitants of the island, not a trace remains; but similar tribes are still found in small numbers in several parts of the peninsula. Of the native population, the Chinese are the most useful part; they form almost the only body of trustworthy native merchants in the proper sense of the word, and are freely trusted to large amounts by European importers; and, as a commercial body, they are, on the whole, perhaps no more deficient in morality than many European communities. The laws are those of Great Britain, with some modifications; the court is that of a recorder. S. being a free port, the revenue is raised by inland excises on opium and spirits. S. is the seat of govt. for the Straits Settlements (q.v.), which 1867 were transferred from the control of the Indian govt. to that of the sec. of state for the colonies.

The town of S., which, as we have seen, contains two thirds of the whole population of the settlement, is at the mouth of a small river, on the s. side of the island. It is the seat of govt. for the whole of the Straits Settlements. It has a mixed oriental and European appearance; the streets are generally wide, and kept in good order; and the town is lighted with gas. There is an efficient police, and the sanitary arrangements are good. The municipal council consists of public officers and ratepayers.

S. possesses two fine harbors; one opposite the town, which, although little more than an open roadstead, is a safe and convenient anchorage, where ships load and discharge by means of lighters; the other, about 3 m. w. of the town, is landlocked, and admits the largest vessels. Along its shores, extensive wharfs have been erected by steam-companies and individual merchants; and it is probable that when communication by railway with the town is established, the old harbor will be little used. There are several fortifications commanding the harbor and roads, but the increasing commercial and political importance of the place calls for a still stronger naval and military station. S. being within 80 m. of the equator, has little variety of seasons; the climate, though hot, is healthful; the temperature ranges from 71° to 92°; rain falls more or less on 200 days of the year, and the extent of the fall is about 87 inches. The soil of S. is not fertile, though the climate is such as to cover it with rich and beautiful vegetation. The nutmeg was formerly successfully cultivated, but most of the trees having unaccountably died, this culture has been abandoned, and husbandry is now confined to the cultivation of the cocoa-nut, the pepper-vine and gambir plant, and to the raising of sugar-cane and vegetables for local consumption. The curse of S. is the tiger. It is estimated that 300 Chinamen and other natives are carried off yearly. Turtle are abundant on the shores, and form the cheapest animal food in the bazaars.—See Thomson's *Journal of the Indian Archipelago;* J. Crawford's *Dictionary of the Indian Islands and Adjacent Countries;* J. Cameron's *Our Tropical Possessions in Malayan India.*

Pop. (1871) 97,111—of whom 61,752 were in the town and environs, 31,235 in the country, 4,124 on vessels. Census reports (1871) show the races in the proportion following: Europeans and Americans 1,946; Chinese about 54,000; Eurasians, Armenians, and Jews 2,285; Malays and Klings or emigants from S. India about 37,000. Pop. (1881) 172,993; (1891) 182,650; (1901) 228,555.

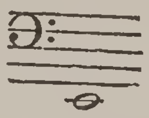
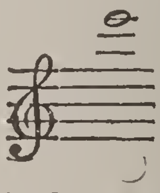
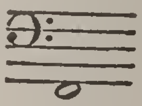
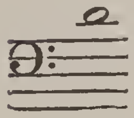
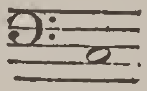
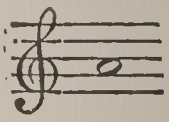
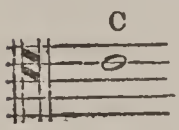
SINGE, v. *sĭnj* [Dut. *zengen*, to burn superficially: Icel. *sangra*, to murmur; *sangr*, having a burnt taste: AS. *sengan*, to singe: an imitative word—*lit.*, to make to sing]: to burn slightly or superficially; to scorch, as hair from the surface: N. a burning of the surface; a slight burn. Singe'ing, imp.: N. act of one who singes; a superficial burning. Singed, pp. *sĭnjd.* Singer, n. *sĭnj'ėr*, one whose trade it is to singe or burn off the upstanding hairs on muslin or other cotton fabrics, as *gas-singer;* a singeing-machine.

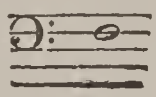
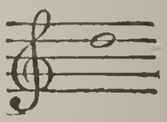
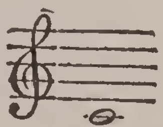
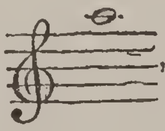
SINGH, n. *sĭng* [Punjabi. Hind., etc.]: a lion: used as a title by Rajpoots, Sikhs, etc., as Gholab *Singh*, or more rarely in the names of places, as Sing(h)apore, the city of lions.

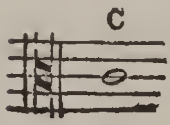
SINGHALESE' (or Sinhalese' or Cingalese') **Language**: see Ceylon.

SINGHA'RA NUT: see Trapa.

SINGING: art and science of producing music from the human voice, generally, though not necessarily, combined with speech. The mechanism of the vocal organs, as applicable to S., has by some physiologists been likened to a reed, by others to a stringed instrument; in fact, the human voice is produced by an apparatus far beyond either in complexity of structure.

The extreme limits of the voice in respect of pitch may be considered to be from  to , but the compass of any individual voice is limited to a portion of that range; and voices are classified according to their pitch. Generally male voices are an octave below female. The male are divided into *bass* and *tenor*, the compass of ordinary bass voices being considered to be from  to , and of tenor from  to  For tenor music, the tenor or C clef is sometimes used, 

, which has the advantage of having the principal tones within the staff. When the treble clef is used, the music is written an octave above its true pitch. Female voices are either *contralto* (otherwise called *alto*) or *soprano*, the former extending from  to , the latter from  to , or sometimes higher.

Contralto music may be noted ether on the treble clef, or on the alto clef, which latter is but the tenor clef placed on the third instead of the fourth line of the staff 

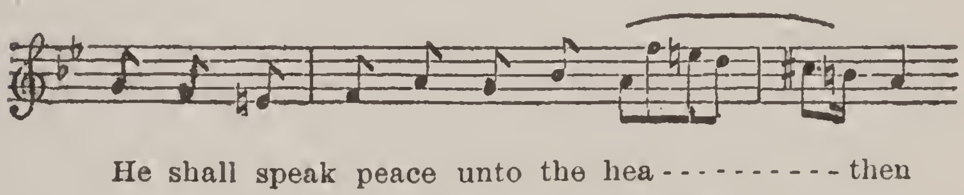
These are the principal divisions of voices:

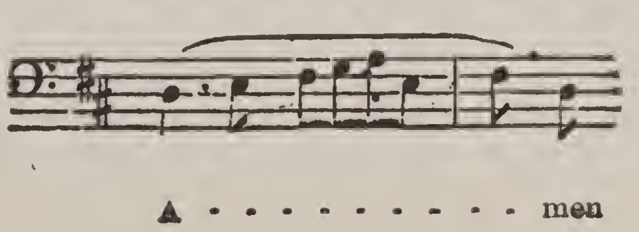
but there are further subdivisions. Intermediate between bass and tenor is another male voice, called *barytone;* and intermediate between contralto and soprano, another female voice, called *mezzo soprano*. The ordinary compass of a voice is about 12 notes, but two octaves are frequent, and some voices have reached three. Madame Catalani is said to have possessed a voice of three and a half octaves compass.

The notes produced in S. are of two kinds, according as they proceed from the chest voice (*voce di petto*) or head voice (*voce di testa*). The chest notes, or lower register, proceed naturally and readily from the ordinary mechanism of the voice; the upper register, head voice, or falsetto, is produced by a more or less forced contraction of the cavity from which the voice proceeds, imparting to the notes a fife-like character, gentle and weak in the male voice, but often clear and sonorous in the female. It is only in the higher notes of the voice that the falsetto is used, and some notes on the borders of the two registers may be given in either. Where the two registers meet, the tones are liable to be hard and uncertain, or weak; but a cultivated singer will blend the head and chest voice at the point of junction so as to make the break imperceptible. The notes of the bass voice are given entirely from the chest. In the tenor, the three or four upper notes belong mostly to head voice. The contralto tones are mostly chest voice, and the upper tones of the soprano are head voice. The alto, when sung by male voices, is principally falsetto.

In S. the head should be held erect, and the chest well expanded, to allow free play to the lungs, and free emission of the voice from the throat. Proper regulation of the breath, and proper articulation of the words, are essential.

One particular requires to be mentioned, in which the notation of songs differs from that of instrumental music. In the latter, two or more quavers or semiquavers may be grouped together by a common line; in S. this can be done only when the whole group are to be sung to one syllable, and notes belonging to different syllables are always written separately. When notes without hooks, or notes not grouped, belong to one syllable, they are bound together by a *slur* placed over them, e.g.:





Among the principal objects to be studied in cultivating the voice for S. are the improvement of its quality in clearness and resources; the rendering every note in its compass equally pure; the extension of its compass, not by injudicious forcing, but by gradual practice; and the acquirement of the power to prolong any note with perfect ease. See MUSIC: VOICE: SOLFEGGIO.

SINGLE, a. *sĭng'gl* [L. *singŭli*, one to each, separate; It. *singulo*]: consisting of one only; not double; separate; having no companion; uncompounded; alone; unmarried; done with one only; one on each side, as a *single* combat: honest; pure; in *OE.*, weak; silly: V. to choose one from others; to select, followed by *out;* in *OE.*, to withdraw; to take alone; to separate. SIN'GLING, imp. *-glĭng:* N. the operation of removing superfluous plants from the drill, leaving only single plants at certain distances from one another. SIN'GLED, pp. *-gld.* SIN'GLY, ad. *-glĭ*, individually; only; by himself. SIN'GLENESS, n. *-gl-nĕs*, the being separate from all others; freedom from duplicity; honest plainness. SIN'GLES, n. plu. *-glz*, the reeled filaments of silk twisted to give them firmness. SINGLE-BAR, the cross-piece of a carriage to which the traces of a single horse are fixed. SINGLE ENTRY, in *book-keeping*, applied to the method of keeping business books by carrying the record of each transaction to the debit or credit side of a single account. SINGLE-HANDED, a. by one's self; alone. SINGLE-HEARTED, a. having no duplicity. SINGLE-MINDED, a. having a single purpose; upright. SINGLE STATE, the state of being unmarried; celibacy. SINGLE-STICK, a cudgel used in fencing or fighting; a certain game with cudgels.—SYN. of 'single, a.': one; particular; individual; alone; unmarried; simple; singular; honest; sincere; separate; uncombined; unmixed; unbiased; unprejudiced.

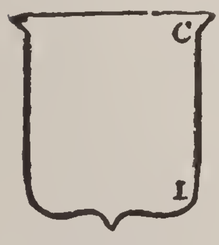
SING SING, *sĭng'sĭng:* former name of a village in Westchester co., N. Y., now called Ossining; on the Hudson river, and on the New York Central and Hudson River railroad; 33 m. n. of New York. It affords a grand panorama, overlooking the river, the Palisades, Highlands, Tappan and Haverstraw bays, several villages, and many spots of historical interest. The village is noted for its beautiful residences, many of them the summer-homes of New York business men, and as the location of a famous state-prison for both sexes, begun 1825, and built of white limestone. There are 7 churches, 1 public school, 1 Rom. Cath. school, 12 private schools, several schools for preparing boys for the U. S. Milit. Acad., seminary and several institutes for young ladies, 1 national bank (cap. $100,000), 1 savings bank (surplus $209,295), and 2 weekly and 1 monthly periodicals. The industries comprise foundry and machine-shop products, lime, files, stoves, gas and water pipes, hats, cotton-gins, steam-engines, carriages, and sleighs. Skilled labor is now prohibited in the prison. The name Sing Sing, which had become synonymous with prison was changed to Ossining in 1901. Pop. (1880) 6,578; (1890) 9,352; (1900) 7,939.

SINGULAR, a. *sĭng'gū-lėr* [L. *singulāris*, single, solitary —from *sin'gŭli*, one to each: F. *singulier*, singular]: not complex or compound; expressing only one person or thing; not plural; proper or individual. as a *singular* term; remarkable; unexampled; of which there is but one; rare; unique; uncommon; peculiar; odd, expressing disapproval strange. SIN'GULARLY, ad. *-lĭ.* SIN'GULAR'ITY, n. *-lăr'ĭ-tĭ*, some character or quality of a thing by which it is distinguished from others; peculiarity; particular privilege or distinction; eccentricity; oddity. SINGULAR PROPOSITION, in *logic*, one which has for its subject a singular term, or a common term limited to one individual. SINGULAR SUCCESSOR, in *Scotch law*, one who succeeds to ownership of property by purchase or otherwise than by descent. SINGULAR TERM, in *logic*, a term which stands for one individual.—SYN. of 'singular': unexampled; unprecedented; remarkable; uncommon; strange; fantastic; odd; eccentric; eminent; extraordinary; unusual; rare; single; one; particular; alone.

SINICAL: see under SINE 1.

SINIGAGLIA, *sē-nē-gâl'yâ*, or SENIGALLIA, *sā-nē-gâl'lē-â* (anc. *Sena-Gallia*): city and seaport on the e. coast of Italy, province of Ancona, 17 m. w.n.w. of the city of Ancona; at the mouth of the Misa. It is a bright, cheerful city, built in modern style, walled round; and it has bastions and handsome gates. It has a modern cathedral, and a large Jewish synagogue. S. is famed for its annual fair, July 20 to Aug. 10, which sometimes puts in circulation about 60 million francs in 20 days. This fair dates from A.D. 1200. English, French, Swiss, Americans, Germans, etc., attend it S. was founded by the Senonian Gauls, and colonized by the Romans B.C. 289.—Pop. (1881) exclusive of suburbs 6,634, commune 22,499.

SINISTER, a. *sĭn'ĭs-tėr* [L. *sinister*. on the left hand or side: It. *sinistro:* F. *sinistre*]: on the left; evil; corrupt; dishonest; inauspicious: in *her.*, denoting the left side of the escutcheon in respect of the bearer (see POINTS OF THE ESCUTCHEON). SIN'ISTERLY, ad. *-lĭ.* SIN'ISTRAL, a. *-trăl*, belonging to the left hand; having spiral turns toward the left. SIN'ISTRALLY, ad. *-lĭ.* SIN'ISTROUS, a. *-trŭs*, being on the left side, or inclined to it; wrong; absurd. SIN'ISTROUSLY, ad. *-lĭ.* BAR SINISTER: see BAR. *Note.*—In *her.*, the accent of SINISTER is usually on the second syllable, thus, *sĭn-ĭs'tėr.*—SYN. of 'sinister': left; bad; perverse; corrupt; dishonest; unfair; unlucky; inauspicious.



CI, sinister side; *C*, sinister chief; *I*, sinister base.

SINISTRORSAL, a. *sĭn'ĭs-trŏr'săl* [L. *sinistror'sus*, toward the left side—from *sin'ister*, on the left hand; *versus*, turned—from *vertĕrĕ*, to turn]: rising from left to right. SIN'ISTRORSE, a. *-trōrs*, in *bot.*, applied to a spiral directed toward the left.

SINK, v. *sĭngk* [Goth. *siggquan;* Icel. *sökkva;* Ger. *sinken;* Dan. *synke;* Sw. *sjunka,* to fall to the bottom. AS. *sincan,* to sink]: to fall or go downward, as in water or mud; not to swim; to go to the bottom; to diminish in quantity; to subside; to lose or want prominence; to be overwhelmed or depressed; to penetrate into any body; to penetrate the mind or understanding; to settle to a level; to fall or retire within the surface of anything; to immerse in a fluid; to depress; to make to fall; to degrade; to crush; to dissipate; to make by digging, as a well or pit; to surrender capital permanently for the sake of large interest; to invest money more or less permanently in any undertaking, as in the building and plant of a manufactory; in *OE.*, to suppress; to conceal: N. an open box of wood lined with lead, or one of stone, with a pipe in the bottom for carrying off superfluous or dirty water; that under which anything sinks or descends; that in which corruption, physical or moral, is gathered; a drain; a kennel. Sink'ing, imp. Sank, pt. *săngk,* did sink. Sunk, pp. *sŭngk,* penetrated into; settled to a level; subsided. Sunken, a. *sŭngk'ĕn,* lying on the bottom of a river or harbor, or other water. Sinker, n. *sĭngk'ĕr,* he who or that which sinks; a weight used to sink a net or fishing-line. Sinking fund: see Fund.—Syn. of 'sink, v.': to drop; fall; tumble; droop; flag; languish; pine; subside; descend; decline; lower; decay; decrease; lessen; reduce; waste; depress; degrade; crush; overbear; diminish.

SINLESS, SINLESSNESS: see under Sin.

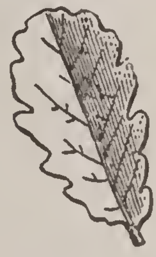
SINOLOGUE, n. *sĭn'ō-lŏg,* or Sinologist, n. *sĭn-ŏl'ō-jĭst* [F. *sinologue,* a student of Chinese—from Ar. *Sin,* for *Chin,* the empire of China; *Sinim,* the Chinese; Gr. *logos,* discourse]: one who devotes himself to the scientific study of the Chinese language and literature. Sinology, n. *sĭn-ŏl'ō-jĭ,* the study of the Chinese language and kindred subjects.

SINOPE, *sĭn-ō'pē* (Turk. *Sinub*): a town of Asiatic Turkey, province of Anatolia, on the s. side of a little promontory jutting e. into the Black Sea, 80 m. n.w. of Samsun. S., which is defended by some half-ruined fortifications, has a dock-yard and naval arsenal; and exports timber, dried fruits, tobacco, bay-leaves, and oil. The bay of S., which affords the finest anchorage for ships along the whole n. coast of Asiatic Turkey, and is the finest natural harbor except one, on the Black Sea, was the scene of a bloody naval engagement, or rather massacre, 1853, Nov. 30, when a Turkish squadron of 13 ships was suddenly attacked and destroyed by the Russian fleet. Of the ancient city of S., founded by a colony of Milesian Greeks, and for 200 years after the Peloponnesian war, almost the mistress of the Euxine, numerous ruins still exist, 'friezes, hundreds of Corinthian columns, capitals, sculptures, inscriptions, and even statues, built up into the walls of its picturesque Byzantine fortifications.' S. was the birthplace of Diogenes the cynic.—Pop. about 10,000, nearly three-fourths Mohammedans

SINOPER, n. *sĭn'ō-pėr*, or Sin'ople, n. *-pl* [L. and Gr. *sinōpis*, kind of red ochre found near *Sinōpē*, now called *Sinub*]: a ferruginous quartz or jaspėr, of a blood or brownish red color. Sin'ople, n. in *her.*, continental term for the color green (see Vert). Sinopia, n. *sĭ-nō'pĭ-ă*, or Sinopite, n. *sĭn'ō-pīt*, fine red pigment, much used by the ancients.

SINTER, n. *sĭn'tėr* [Ger. *sinter*, dross, sinter; *sintern*, to drop, to petrify]: compact incrustations from siliceous or calcareous springs. S. deposited from hot springs is usually siliceous, that from cold springs is frequently calcareous. S. formations are recent, belonging to the strata at present in course of formation. S. is of various forms; kidney-shaped, knotted, tuberous, botryoidal, tubular, stalactitic, shrub-like, or pronged: and is occasionally distinguished by its chief component as Calcareous or Calc S., Flint or Quartz or Siliceous S., Iron S., etc. S. is distinguished from *tuff* or *tufa*, which is open and porous, by returning a hard ringing sound to the hammer. Calcareous S., a variety of carbonate of lime, composed of concentric plane parallel layers, appears under various forms; it is deposited with extraordinary rapidity by many springs, a peculiarity frequently used to obtain the incrustation of objects with a coating of this substance. Quartz S. is found mostly in intermittent hot springs, e.g., the Geysers (q.v.) of Iceland. Iron S. occurs in old mines, and in coal-beds, where it is formed from iron pyrites through the agency of the atmosphere. The tubular conglomeration of grains of sand half-melted by lightning (*blitz*) is known as Blitz-S., or Fulgurite (q.v.). In Italy calcareous S. is used as a building stone, under the name Travertine (q.v.). Pearl S. is a variety of opal of pearly lustre.

SINUATE, a. *sĭn'ū-āt* [L. *sinŭātus*, swelled out in curves; *sinuārĕ*, to curve—from *sĭnus*, a bent surface, a curve: F. *sinué*, having sinuses or incisions]: in *bot.*, cut so as to have a broken and wavy margin—applied to the margin of a leaf: V. to wind; to bend in and out. Sin'uating, imp. Sin'uated, pp. Sin'ua'tion, n. *-ā'shŭn*, a winding or bending in and out. Sin'uous, a. *-ŭs*, or Sin'uose, a. *-ōs* [F. *sinueux*—from L. *sinŭōsus*, full of bendings or windings]: wavy; bending in and out; undulating. Sin'uously, ad. *-lĭ*. Sin'uos'ity, n. *-ŏs'ĭ-tĭ*, the quality of winding in and out; a series of bends and turns.



Sinuate Leaf.

Sinus, n. *sī'nŭs*, a bend or recess in the coast: in *anat.*, a cavity or irregular channel in a bone (see below): a dilated form of vein: in *surg.*, an elongated cavity containing pus (see Fistula): in *bot.*, the indentation or recess formed by the lobes of leaves; a groove or cavity. Sinuses, n. plu. *sĭn'ū-sĕz*, hollows or cavities, as in the bones, or in the dura-mater.

SI'NUS: term with two significations in Anatomy, and one in Surgery.—In anatomy, the cells or cavities in certain bones—e.g., the frontal, ethmoid, sphenoid, and superior maxillary—receive this designation. The frontal sinuses are two irregular cavities extending upward and outward, from their openings on each side of the nasal spine, between the inner and outer layers of the skull, and separated from one another by a thin bony septum. They give rise to the prominences above the root of the nose called the nasal eminences. They are not developed till after puberty, and vary considerably in size, being usually larger in men than in women and young persons, because of the greater prominence of the superciliary ridges in the former. When very much developed, they give a receding appearance to the forehead. They are larger in Europeans than in negroes, and are very imperfectly developed in the Australians, whose peculiar want of vocal resonance is apparently due to this deficiency. They communicate on each side with the upper part of the nostril by a funnel-shaped opening, which transmits a prolongation of mucous membrane to line their interior. These cells are much more highly developed in certain mammals and birds than in man. Prof. Owen observes that 'they extend backward over the top of the skull in the ruminant and some other quadrupeds, and penetrate the cores of the horns in oxen, sheep, and a few antelopes. The most remarkable development of air-cells in the mammalian class is presented by the elephant; the intellectual physiognomy of this huge quadruped being caused, as in the owl, not by the actual capacity of the brain case, but by the enormous extent of the pneumatic cellular structure between the outer and inner plates of the skull.' The sphenoidal sinuses are two large irregular cavities, formed, after the period of childhood, in the body of the sphenoid bone: they communicate with the upper part of the nose, from which they receive a layer of mucous membrane. Like the frontal sinuses, they serve to lessen the weight of the skull, and to add to the resonance of the voice. The ethmoid sinuses or cells lie in the lateral masses of the ethmoid bone: they open into the cavities of the nose. Their main use is to diminish the weight of the fore-part of the skull. The superior maxillary sinus commonly known as the *Antrum of Highmore* (the anatomist who first accurately described it) is the largest of the facial sinuses: its uses are the same as those of the others, and like them, it communicates with the nasal cavities.

The *sinuses of the dura-mater* are quite distinct from the above-described bony sinuses; they are irregular channels for the transmission of venous blood, and are formed in the following way. The dura-mater consists of two layers—an outer, belonging to the skull, and an inner, belonging to the brain. They can be easily separated in infancy, but in the adult they are blended together for the greater part of their extent. In some places, however, as beneath the sagittal suture (formed by the two parietal bones at the top of the head, and running from before backward), they are separated on either side of the mesial line, the outer layer being continued beneath the bone, and in contact with it; while the inner one dips inward, and meeting with the corresponding layer of the opposite side, forms a triangular canal or sinus, strengthened at the sides and angles by interlacing bands of fibrous tissue. The sinus whose formation we have thus described is called the superior longitudinal sinus, and the other sinuses are formed in the same way. They all are lodged in the intervals between the great divisions of the brain, and they are so constructed 'that their shape cannot easily be altered by any external pressure; consequently, the flow of blood through them cannot be impeded by the pulsations or pressure of the brain, in the varying positions of the body. The tense, unyielding character of their walls, moreover, does not admit of either collapse or distention; hence, they must be equally full at all times, and must exert a uniform pressure on the brain.'—Humphry *On the Human Skeleton*, p. 200.

In surgery, the term *sinus* is nearly equivalent to *Fistula* (q.v.).

SION, *sē-ōng′:* small town of Switzerland, cap. of the canton of Valais, in a picturesque situation on the right bank of the Rhone, 18 m. n.e. of Martigny by the Simplon railway. It is defended by walls, towers, and a ditch; and contains a large cathedral, a handsome Gothic townhouse, a Jesuits' convent, and an ancient prison. N. of the town is a lofty rock, divided into two peaks by a deeply-cut ravine: on the highest peak is the ruined castle of Tourbillon, built 1294; on the other, the castle of Valeria, now used as a seminary. An excellent wine, called Malvoise, is made here. S. is called *Civitas Sedunorum* in an inscription in honor of Augustus, still seen in the cathedral: in the middle ages it was named *Sedunum.*—Pop. 5,000.

SIOUT, *sē-ôt′*, or Asyoot, *â-sē-ôt′*, or Es Sioût, or Osiût: chief city of Upper Egypt, near the w. bank of the Nile, 200 m. in direct line s. of Cairo. It has several fine mosques, bazaars almost as well furnished as those of the capital, some good baths, and one or two well-built houses. S. manufactures great quantities of the best pipe-bowls. It is the residence of the gov. of Upper Egypt; the resort of the caravans from Darfur, that come by the way of the Great Oasis; and until recently was the principal seat of the Egyptian slave-trade. S. is built on the site of the anc. Lycopolis, but few remains of the Græco-Egyptian city are extant. From the neighboring heights of the Libyan mountains, which contained numerous rock-sepulchres, the view over the valley of the Nile is, in the opinion of Lepsius, the finest in Egypt.—Pop. about 25,000.

SIOUX.

SIOUX, *sôz,* or DAKOTAS, *da-kō'taz:* group of Indian tribes, inhabiting, when first visited by the French, what is now n. Minnesota. Jean Duluth first claimed their country for France 1680, followed by Nicholas Perrot, who fortified a position at Lake Pepin 1689. As reported by Le Seur, there were 16 bands or tribes at that time, with whom and the Foxes the French had some conflicts. In subsequent Indian war the S. were driven south, spreading as far as the lower and upper Missouri river; and they have been in later years grouped with a family race, including the Assiniboines, Winnebagoes, Omahas, Iowas, Kansas, and Crows. In the war of 1812 the S. were allies of Britain. The region occupied by them in the first part of this c. was from the Mississippi to the Black Hills, and from Devil's Lake, in the centre of n. Dakota, as far s. as the present Sioux City. Their lands e. of the Mississippi were bought, 1837, by the United States for $300,000; and 1851 all e. of nearly the present w. boundaries of Minn. and Io., except a reservation of 2,800 sq. m.—the rate paid being about $1 per acre. The usual failure to meet stipulations led to unfriendly feelings; and an outbreak occurred when, 1854, on the attempt of Lieut. Grattan to arrest an Indian, he and his force were killed. After many conflicts Gen. Harney enforced peace the next year. But other outbreaks followed, such as the bloody massacre of nearly 50 settlers at Spirit Lake, Io., 1857, and others in Minn. 1862. Deeming themselves wronged by the govt. and its agents, the S. entered on a general war, at the cost of a thousand lives of the whites. Gens. Sully and Sibley conquered the tribes of the Missouri river region; and of more than a thousand captives, 39 were hung for proven crimes. The prisoners were sent to Davenport, Io., where they were cared for by the benevolent Col. Davenport (founder of the city), whom they worshipped as their friend. The S. reservation was afterward the w. half of the present S. Dak., beyond the Missouri river. The treaty of Gen. Sherman 1868 was opposed after gold was discovered in the Black Hills. The 'Messiah craze' of 1890 was the occasion of a rising of the S. in N. Dakota, and a massacre by U. S. soldiers.

Rom. Cath. missions were established among the S. 200 years ago; and Prot. missions in later times. No more thorough missionary work has ever been done among the Indians, than by Stephen R. Riggs, D.D., LL.D., and his assistants of the Amer. Board missions to the S. tribes; his *Grammar and Dictionary of the Dakota Language* forms a 4to vol. of the Smithsonian Contributions to Knowledge; and he has published numerous school and religious books in the language.

The S. are now distributed on different reservations in Montana, Nebraska, N. and S. Dakota, and number (1899) 20,865.

SIOUX CITY, *sô:* city, cap. of Woodbury co., Io.; on the Missouri river, and on the Chicago, Milwaukee and St. Paul, the Chicago, St. Paul, Minneapolis and Omaha, the Ill. Central, the Pacific Short Line, the Sioux City and Northern, the Sioux City and Pacific, and the Union Pacific railroads; 100 m. n. of Omaha, 270 m. s.w. of St. Paul, 544 m. w. of Chicago; 39 sq. m.; known as 'the Corn Palace City.' S. was a trading post, was incorporated 1856; and 1902 had net public debt $1,116,000; assessed val., tax, prop. $6,148,753; tax rate $8.40 on $100. Its growth has been remarkable, due to its exceptional railroad facilities, water communications, varied and extensive industries, and to the activity and liberality of its business men. It is 1,100 ft. above sea-level; is handsomely laid out, with broad streets crossing each other at right angles; is supplied with water from the river by a system completed 1885; has a perfect system of sewerage; is lighted by gas and electricity; and 1890 had 35 m. of paved streets, cedar blocks being used on about one half, and 34 m. of street railroad (electric and cable. An elevated railroad system was completed for use in 1891. The Missouri river is here crossed by several bridges for railroad and general purposes, the principal one 2,000 ft. long, costing about $2,000,000, and free to all railroads entering the city. A pile and pontoon summer bridge was built by the Pacific Short Line road 1890, and a more costly one for general purposes was begun by the same road 1891. The city is in the heart of a great corn-growing region, and more than one-half of the entire flaxseed product of the United States is grown within 125 m. of it. It contained (1890) the largest linseed-oil mill in the world, which cost $450,000, had a daily cap. of 100 bbls. of oil and 80,000 lbs. of oil-cake, consumed in a year about 600,000 bushels of seed, valued at $750,000, and received $1,000,000 for products. In 1890 the principal industry was slaughtering and meatpacking. The Union stock-yards cover 1,400 acres; have a capacity of 2,000 sheep, 2,000 horses and mules, 6,000 hogs, and 10,000 cattle at one time; and 1890 received 758,343 hogs (value $9,100,116), 170,858 cattle ($4,271,450), 27,812 sheep ($83,436), and 1,592 horses and mules ($143,280). The 3 pork-packing establishments (handled 723,578 hogs in season 1889–90), 1 beef, and 1 sausage, cost more than $3.000,000, and did a combined business of about $30,000,000. There were in all (1900) 329 manufacturing establishments, including flour and oatmeal mills, potteries, foundries and machine-shaps, brick and tile works, and minor industries. The annexation of the manufacturing suburb of Leeds, in accordance with a special election 1890, Oct. 20, greatly increased the industrial int. of the city. There were (1890) 63 wholesale houses in the city; jobbing trade aggreg. $16,000,000; 12 commercial banks with $4.500,000 capital and $500,000 surplus; 32 loan and trust and mortgage companies with $35,038,000 capital; and a clearing-house, organized 1888, which had clearances (1889) $30,957,175 and (1890) $79,365,653. In

1902, there were 6 national banks (cap. $950,000). S. F. also had 7 incorporated associations (cap. of 6 $1,000,000), 6 state banks (cap. of 5 reporting $775,000), and 1 private bank.

In 1890 there were 43 churches, which included 7 Lutheran (cost $99,500); 6 Meth. Episc. ($81,500); 4 Rom Cath. ($108,000); 4 Congl. ($85,300); 3 Presb. ($47,500); 3 Prot. Episc. ($29,500); 1 Unit. ($27,000); and 1 German Evang. Assoc. ($7,000). The oldest church organization is the 1st Presb. (1857, Aug. 2), the next the 1st Congl., just one week younger. The new building of the latter (cost $75,000, dedicated 1890. Sep. 7) is the handsomest church edifice in the city. Public education is afforded by 30 schools, which have 7,000 pupils, and 3 grades of common-school work, supplemented by a thorough high-school course, and a teachers' training-school. A site (cost $75,000) was bought for a public high-school building 1890. Superior instruction is provided by the Morningside Col. (Meth. Episc.), which was organized early in 1890, erected its first building (college of technology) in the summer, laid the corner-stone of its main building (college of liberal arts) Sep. 8, and opened its first term Sep. 17. The institution has a campus of 10 acres, a library of 4,000 volumes, a college of liberal arts, with classical, philosophical, scientific, and literary courses; and colleges of music, theol., medicine, pharmacy, dental surg., law, technology, practical economics, agriculture, and commerce. The Rev. Wilmot Whitfield, D.D., was elected the first pres. of the inst. Excellent instruction is also provided in St. Mary's Convent School (Rom. Cath.), for which a new building, costing $23,000, was erected 1890. There are also two hospitals, several homes and asylums, a public library, and 3 daily, 8 weekly, and 1 semi-weekly periodicals.

The first corn palace, a notable structure ornamented with stalks, husks, and ears of corn, and costing $30,000, was erected 1887. In 1888 a palace 150 ft. sq. was built at a cost of $60,000. The palace of 1889 was 240 x 120 ft. in dimensions, with a tower in the centre 200 ft. high, and that of 1890 was an elaborate oriental palace, 264 ft. sq., with large and high rotunda, tower 172 ft. high, auditorium with seating capacity of 1,200, band-stand, promenade, galleries, and innumerable attractions. Five in all were erected. Interstate fairs are held in Riverside Park. Pop. (1880) 7,366; (1890) 37,806; (1900) 33,111.

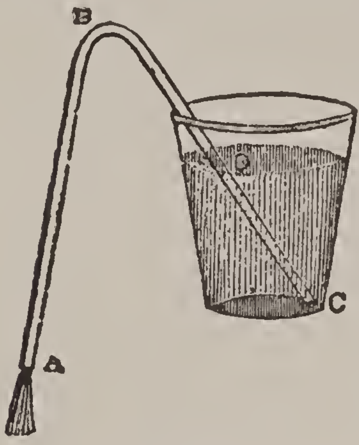
SIOUX FALLS, *sô:* city, cap. of Minnehaha co., S. D.; on the Big Sioux river, and on the Chicago St. Paul Minneapolis and Omaha, the Chicago Milwaukee and St. Paul, the Burlington Cedar Rapids and Northern, the Illinois Central, and the St. Paul Minneapolis and Manitoba railroads; 190 m. n. of Omaha, 240 m. s.w. of St. Paul, 553 m. n.w. of Chicago. It is in an undulating prairie region; has exceptional water-power from the river, which falls 110 ft. in ½ m.; and possesses great natural wealth in inexhaustible quarries of magnificent jasper-stone. The city contains about 50 m. of streets; waterworks, gas-works, electric lights, street railroads, and a public park, comprising a large forest-clad island, at the head of the falls, overlooking the cascades. The churches include Bapt., Congl., Free Bapt., Free Meth., Meth. Episc., Norwegian Luth., Presb., Prot. Episc., Ref., Rom. Cath., Swedish Bapt., Swedish Luth., Seventh-day Adventist, and Unitarian; value of church property $264,000. The public-school prop. cost $350,000, and the pupils enrolled in 1901 num. 2,227; teachers 52. There are 4 col.—All Saints' (Prot. Episc.), Sioux Falls Univ. (Bapt.), St. Rose's (Rom. Cath.), and Norwegian Normal Univ.; 1 business college; and 7 public-school buildings. There were (1902, Sep.) 2 nat. banks (cap. $200,000), 4 incorporated banks (cap. $350,000), 1 savings bank (cap. $50,000), and 3 priv. bks.; and 2 daily, 7 weekly, and 3 monthly periodicals. The industries comprise the manufacture of brooms, blank-books, bricks, beer and ale, confectionery, cigars, cheese and butter, flour and feed, foundry and machine-shop products, sorghum, furniture, wagons and carriages, besides quarrying and stone polishing. Pop. (1880) 2,164; (1890) 10,154; (1900) 10,266.

SIP, v. *sĭp* [related to *sap*, *sop*, *sup*, representing the sound of a liquid in sucking or agitating in a confined space: Dut. *zuipen*, to sup up: O. Dut. *sippen*, to take small draughts]: to imbibe in small quantities with the lips; to drink or taste in small quantities; to suck up; to drink out of: N. a small draught; as much as the lips take up at one movement. SIP′PING, imp. SIPPED, pp. *sĭpt.* SIP′PER, n. *-pėr*, one who sips.

SIPE, v. *sīp* [AS. *sipan*, to distil: prov. Ger. *sijpen*, to ooze out]: in *prov. Eng.*, to ooze or drain out slowly. SIP′ING, imp. *sīp′ĭng:* N. act of oozing. SIPED, pp. *sīpt.*

SIPHILIS: see SYPHILIS.

SIPHON, n. *sī′fŏn* [F. *siphon*—from L. *sipho* or *siphōnem*, a hollow reed—from Gr. *siphōn*, a small reed]: a bent pipe or tube whose arms are of unequal length, used chiefly for drawing off liquids from casks, etc. (see below): N. PLU. the respiratory tubes in the mollusca; tubes of different functions. SIPHONIC, a. *sī-fŏn′ĭk*, pertaining to a siphon. SIPHON-BAROMETER, barometer in which the lower end of the tube is bent upward like a siphon. SIPHON-GAUGE, glass siphon, filled partly with mercury, used to indicate the degree of rarefaction produced in the receiver of an air-pump. SIPHONIA, n. *sī-fō′nĭ-ă*, in *geol.*, genus of fossil sponges, having a pear-shaped body mounted on a slender stalk, occurring abundantly in the chalks and greensands of Europe. SIPHONIFEROUS, a. *sī′fŏn-ĭf′ĕr-ŭs* [L. *fero*, I bear]: having a siphon or siphuncle within a polythalamous shell. SIPHO′NIUM, n. *-nĭ-ŭm*, bony air-tube in some birds.—*Siphon* is a tube bent so that its two legs, usually of unequal length, are either parallel or incline at an acute angle; used to draw off liquids from vessels which it is not desirable to move. If the end of the short leg of a S. be plunged into the liquid, and the other leg be suffered to hang outside the vessel, then, whenever the S. is exhausted of air (a process which can be performed by suction by the mouth or a pump, or by filling the tube with the liquid which it is employed to decant, and keeping it so filled till it is placed in its proper position), the liquid will at once flow out of the vessel through the tube, and continue to flow either till it falls below the level of the outside end, or till the inside end ceases to be immersed. The principle of this simple and efficient instrument is easy of explanation: let ABC (fig.) be a S. with one leg, BC, partially immersed in liquid, and suppose the whole S. filled with the same liquid; then at A the pressure of the atmosphere is acting upward into the tube in opposition to the pressure of the liquid in the leg BA; at C the pressure of the atmosphere (transmitted through the liquid), and the pressure of the liquid in the vessel outside (which balances an equal height of liquid inside) the tube, is acting upward into the tube in opposition to the pressure downward of the liquid in the leg BC. The effective pressures inward at A and C are, respectively, the atmospheric pressure less by the pressure of the liquid in BA, and the atmospheric pressure less by the pressure of the liquid in BD; and as the latter of these two is the greater, it overcomes the other, forces the liquid in the tube out at A, and that in the vessel into the tube at C, the process continuing till the liquid falls to the level of C (thus admitting air), or of A (when the two pressures become equal). It is evident from the above explanation that when A is on or above the level of D, the surface of the fluid, there can be no flow through the tube; also, that it is quite immaterial whether the longer or the shorter leg be immersed, if only A be below the level of D. If the bend of the siphon be 33 ft. for water, or 30 inches for mercury, above D, the pressure at C, which produces the action of the S., becomes the weight of the atmosphere, diminished by an equal weight of a column of fluid, in which case the resulting pressure is zero, and there is no flow through the tube. The flow increases in rapidity and force as the difference of level between D and A increases, and as the difference of level between D and B diminishes. Many siphons have a suction-pump permanently attached to the end of the outer leg for exhausting the air inside. Another variety is the *Wirtemberg siphon*, which has two equal legs, the extremities of which are bent upward, so that when the S. is once filled with fluid, it remains full, and is always ready for use.



Siphon.

SIPHONO-BRANCHIATE, a. *sī'fŏn-ō-brăng'kĭ-āt* [Gr. *siphōn*, a siphon; *brangchĭă*, gills]: having a tube by which water is carried to the gills.

SIPHONOPHORA, n. plu. *sī'fŏn-ŏf'ō-ră* [Gr. *siphōn*, tube; *phoros*, bearing]: a division of the Hydrozoa.

SIPHONOSTOMATA, n. plu. *sī'fŏn-ŏ-stŏm'ă-tă* [Gr. *siphōn*, tube; *stoma*, mouth]: large group of gasteropodous mollusks of order *Pectinibranchiata*, having the mantle prolonged into a siphon, by which the water enters the gill chamber. The shell is spiral, the aperture notched or produced into a canal in front, often much prolonged. To this group belong the families *Cypræidæ* (cowries, etc.), *Volutidæ*, *Buccinidæ* (whelks, etc.), *Muricidæ*, and *Strombidæ*. Almost all are carnivorous, and move about with considerable activity. See also FISH-LOUSE.

Siphonostomata—*Fusus antiquus* (Red Whelk).

SIPHUNCLE, n. *sī-fŭng'kl* [L. *siphun'cŭlus*, a little pipe —from *sipho*, a siphon (see SIPHON)]: any small tube or tubular passage; the tube-like perforation which passes through the septa and chambers of such shells as the nautilus, the ammonite, etc. SIPHUN'CLED, a. *-kld*, having a siphuncle. SIPHUN'CULAR, a. *-kū-lėr*, pertaining to a siphuncle. SIPHUN'CULATED, a. *-lā-tĕd*, furnished with a little siphon or spout.

SIPPET, n. *sĭp'pĕt* [see SIP]: a small sop.

SIPUNCULOIDEA, n. plu. *sī-pŭng'kū-loy'dē-ă* [L. *sipun'cŭlus, siphun'cŭlus*, a little pipe (see SIPHUNCLE): Gr. *eidos*, resemblance]: class of worms now called Gephyrea. SIPUNCULUS, n. *sī-pŭng'kū-lŭs*, genus of marine animals, known as Spoon-worms, belonging to the group *Gephyrea* and family *Sipunculidæ*. In common with the group (referred to a heterogeneous assemblage named *Vermes*), they have no distinct rings nor processes answering for feet, and the nervous system is imperfect. They are, in shape, elongated bags, with very long retractile proboscis and an oval circle of tentacles. Some are found in shells of mollusks, and other species in the sand. They are used for bait, and one species (*S. edulis*) is eaten in some countries.

SIQUIS, n. *sī'kwĭs* [L., if any one]: a notice given in church that a certain person is a candidate for holy orders, to inquire *if any one* can allege an impediment.

SIR, n. *sėr* [F. *sire*, sir or master—contracted from *Seigneur*, from L. *senĭor*, more aged; *senex*, old: It. *sere*, sir, a title of doctors, priests, clerks, etc.]: a word of respect used in addressing any man—*madam* is the corresponding word in addressing women; in *OE.*, a priest; a man.—*Sir* was a term originally corresponding to *dominus* in Latin, and which has come, when appended to the Christian name and surname, to be the distinctive mark of knighthood. It was anciently the practice to use the same title in addressing the clergy, a familiar instance being Sir

Hugh Evans in the *Merry Wives of Windsor*. To so great an extent did this usage obtain, that a 'Sir John' came to be a common sobriquet for a priest: 'sir' was here a translation of *dominus*, the term used for a bachelor of arts, originally in distinction from the *magister*, or master of arts, but eventually extended to the clergy without distinction. Used with the Christian name and surname, 'sir,' as pertaining to the nobility, is now applied exclusively to knights and baronets—the wife of a baronet being styled *lady*. Standing alone, Sir is a common complimentary mode of address used without much consideration of rank or social status.—'Sire' is another form of the same monosyllable, which has been adopted from France as a mode of addressing royalty (see Sire).

SIRASKIER and SIRASKIERATE: see Seraskier.

SIRCAR, n. *sèr-kâr′* [Hind. *sarkar*, a chief, a superintendent—from *sar*, the head; *kar*, work]: in *Hindustan*, a superintendent; a native clerk or writer.

SIRDAR, n. *sèr-dâr′* [Hind. *sardar*, a chief—from *sar*, the head; *dar*, holding]: in *Hindustan*, a native chief or headman; the head of a set of palanquin-bearers.

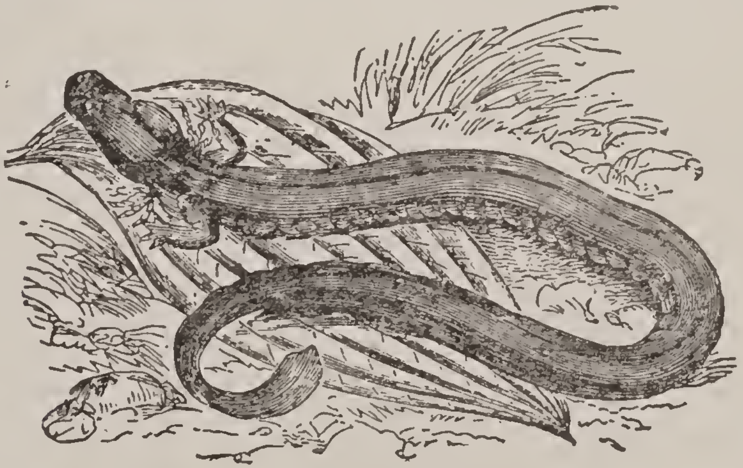
SIR-DA′RIA: see Syr-Daria.

SIRE, n. *sīr* [F. *sire*, sir or master, a title without addition given only to the king, but to others with some addition (see also Sir)]: a word of respect, used only in addressing a king; in *poetry*, a father; the male parent of a beast, particularly of a horse; also used in composition, as *grandsire:* V. as applied to a beast, to beget; to affiliate. Sir′ing, imp. Sired, pp. *sīrd.* Sire′less, a. *-lĕs*, not having a sire.

SIREDON, *sī-rē′dŏn* [Gr. *seirēdōn*, same as *seirēn*, siren]: name of the genus to which belongs the *Axolotl* (q.v.). Naturalists distinguish several species of S.—e.g., *S. mexicanus*, the true Mexican axolotl; *S. lichenoides*, found in Utah, Wyoming, and elsewhere; *S. gracilis*, etc. It is now known, through observations and experiments made with siredons (axolotls) at Paris by Duméril (1865), confirmed by similar observations and experiments of Prof. Marsh, Tegetmeier, Boulenger, and Marie von Chauvin, that S. is the larval form of the salamandroid genus *Amblystoma*—but a larval form arrested in its development, not passing (under its ordinary life-conditions) into the perfect state, yet attaining full power of reproduction. In Duméril's observation, 6 axolotls (5 males, 1 female), that had been for a year in the Paris Museum of Natural History, began to breed. The period of development within the egg was 23–30 days. After 6 months the young were almost as large as the parents, and then one after another began to undergo metamorphosis, like that of the larva of *Triton*, to the adult form. Yellow spots appeared on the skin, the gills disappeared and the gill-slits closed up, the median fin disappeared, the animals began to breathe air, and quit the water permanently. Out of several hundred larvæ, about 30 were thus transformed: the rest retained the larval form of the parents. The metamorphosed siredons were seen to possess all the generic characters of *Amblystoma:* they have been definitively identified with the species *A. tigrinum,* found in Mexico and the United States. Prof. August Weissmann (q.v.) infers that the ancestors of the axolotl passed through the normal life-history of *Amblystoma*, the climate of the Mexican table-land having formerly been moist enough to permit the existence of a terrestrial salamandroid; that the climate is now so dry and unfavorable to vegetation that no amphibian can live in it except in water; and that *Amblystoma* has become adapted to these conditions by ceasing to pass through its metamorphosis, and breeding entirely in the branchiate (gilled) condition. Thus the metamorphosis that takes place sometimes in captivity is a case of Atavism (q.v.). The transformed siredons were kept alive for 10 years in the Paris Museum of Natural History, but showed no signs of sexual activity.

SIREN, n. *sī'rĕn* [L. *sīrēn;* Gr. *seirēn*, a siren—prob. from *seira*, cord or string: It. *sirena:* F. *sirène*]: in *myth.* [Gr., *entanglers*], one of the maidens or birds with the faces of women, who, on the s. coast of Italy, by their sweet voices, enticed ashore those who were sailing by, and then killed them: an enticing or alluring woman (see SIRENS): in *zool.*, a tailed amphibian, like a salamander, found in N. Amer.; the mud-eel (see below): ADJ. pertaining to a siren; bewitching; fascinating. SI'REN, *-rĕn*, or SI'RENE, n. *-rēn*, in *acoustics*, instr. for determining the number of vibrations corresponding to the different pitches of musical sound (see below). SIRENIA, n. plu. *sī-rē'nĭ-ă*, an order of mammalia containing the manatee, or sea-cow, and the dugong, which, from their aquatic habits and the formation of their hinder extremities, have been compared with the *sirens*. SIRE'NIAN, a. *-nĭ-ăn*, relating to the order *Sirenia.*

SI'REN: genus of perennibranchiate batrachia, of eel-like form, but having two small weak limbs on the fore-part of the body. Each foot has four toes. There is no vestige of a hinder pair of feet, nor of a pelvis. The vertebræ are numerous, and each of the vertebræ of the body carries a pair of short ribs. The vertebræ of the tail are compressed, and gradually diminish in size to its tip. The head is flattened, mouth not deeply cleft, muzzle blunt,



Siren Lacertinus.

eyes are very small, ears concealed. The teeth are small; the lower jaw is furnished with them all round; there are none on the upper jaw, but two rows on each side of the palate. On each side of the neck are three gills, each consisting of a short fleshy stalk, supporting a beautiful fringe-like tuft, and water passes from the mouth to the gills through openings as in fishes. But the S. has also lungs, which are long bags, one on each side, beginning behind the heart and extending almost the whole length of the abdomen. The blood-disks are remarkable for their large size, exceeding even those of the proteus. The sirens inhabit the swamps of the Carolinas and other s. parts of N. America. They live chiefly in the mud, but sometimes are seen swimming in the water, and even make excursions on moist ground. They feed on worms and insects. *S. lacertina* grows to the length of about three ft. Its color is blackish. The tail is compressed. The other species are smaller.

SI'REN: instrument for production of musical sounds in such manner as to facilitate discovery of their ultimate nature, by indicating the number of vibrations.

The simplest form of the acoustical instrument known as 'Siren' is represented in section in fig. 1. A vane consisting of four equal plates, attached to a delicately supported axle, is so fixed in a metal tube as to close it almost completely (with the help of stops P, P), when either pair of plates is perpendicular to the axis of the tube. When air is forced from a bellows through the pipe A, it gives the vane a rotation in the direction indicated by the arrow, and thus produces a current which is interrupted four times in each revolution. In other words, four times in each revolution the air escapes freely, giving rise to a sound. While the vane revolves slowly, the ear distinguishes these successive puffs; but when the revolutions are more numerous than about five per second, the successive puffs cannot be distinguished, and the recurrent sounds are merged into a uniform note, whose pitch rises (i.e., it becomes more and more shrill) the faster the vane revolves. Such an instrument works well when driven by water instead of air. What it shows is, that musical sounds consist of the repetition, at equal very small intervals of time, of some definite noise. By turning the vane by means of a train of wheels, so as to give it a definite rate of rotation, the number of such repetitions per second, necessary for production of a given musical note, may be measured.

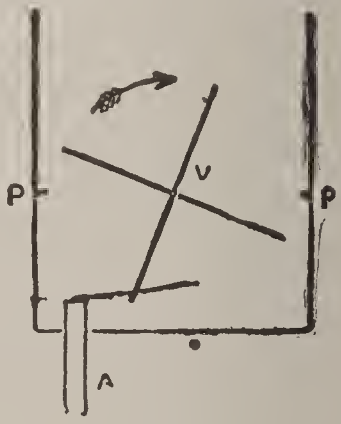


Fig. 1.

But the siren of Cagniard de la Tour is much more valuable for such a purpose, as it counts for itself the number of repetitions per second. In principle, it is identical with the simpler instrument above described; but the details of construction are different. It consists essentially of two circular disks, the upper of which is free to revolve so as almost to touch the lower (fig. 2). In each a series of holes is cut, arranged at equal distances in a circle about its axis. Through the holes in the lower (fixed) plate, streams of air are admitted from a bellows, and pass through

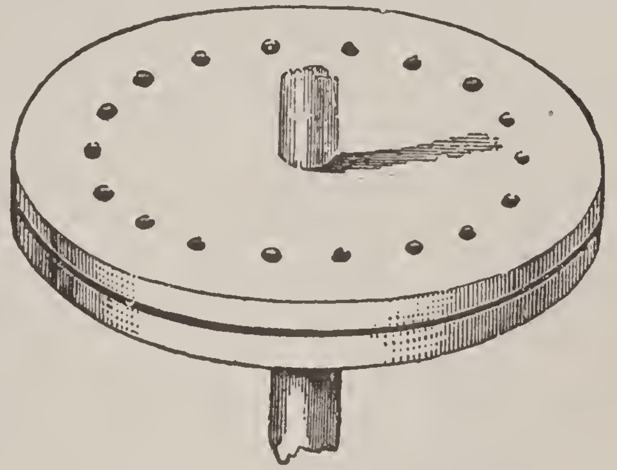


Fig. 2.

the corresponding hole in the upper (movable) plate, when the pairs of holes are superposed; but are checked when the upper plate is turned a little, readmitted when the plate turns a little further, and so on. The holes are pierced *obliquely* through the upper plate, so that the issuing stream makes it turn about its axis. The sounds given by this instrument are exceedingly pure (see SOUND), like those of the flute or tuning-fork. The axis of the upper plate carries an endless screw, which turns a light train of wheels (with dials) resembling that of a gas meter, so that when, by proper adjustment of the pressure in the bellows, the instrument gives steadily some definite note, we may observe the number of turns in any number of minutes by watch. The number of puffs is obviously to be found from this by multiplying by the number of holes in the plate, since during one turn any hole in the upper plate has been opposite each of those in the lower plate in succession: thus we find the number of puffs per second necessary to the formation of any given musical note. More complex forms, such as Helmholtz's double S., have been devised for more recondite purposes. See SOUND.—A S., the fog-siren, is now much used for giving Fog Signals (q.v.).

SI'RENS: in Greek mythology, young maidens, or birds with faces of women, who sat on the shores of a certain island or promontory near the s.w. coast of Italy, and sang with bewitching sweetness songs that allured the passing sailor to draw near, but only to meet with death. Homer speaks of them in the plural, but does not specify their number; later writers mention two or three by name, and assign them various genealogies. Their tenure of life was dependent on the successful exercise of their charms. If any seaman could resist the enticements of their magic music, they were doomed; but Ulysses or the Argonauts alone succeeded in doing so. It is related by Homer, in the *Odyssey*, that when Ulysses in his wanderings approached their perilous home, he, by advice of the sorceress

Circe, stuffed the ears of his companions with wax, and lashed himself to a mast, until he had sailed out of hearing of the fatal songs. Others say that it was the Argonauts who passed safely, owing to the superior enchantment of Orpheus's singing, whereupon the Sirens threw themselves into the sea, and were transformed into rocks. The Latin poets give them wings, and in works of art they are often represented as birds with the faces of virgins, and are provided with musical instruments. There is obviously a close resemblance between the Mermaid (q.v.) of n. mythology, and these Græco-Mediterranean Sirens. The Loreley of the Rhine is only a river-siren, though a more exquisite enchantress than ever Greek fancy conceived.

Siren.

SIRIASIS, n. *sĭ-rī'ă-sĭs* [Gr. *seiriasis*, sunstroke—from *seirĭŏs*, hot, scorching]: in *med.*, a disease of childhood, consisting of inflammation of the brain or its membranes, caused by the excessive heat of the sun.

SIRINAGUR': see SERINAGUR.

SIRI PUL, *sē'rē pôl:* town of Afghan Turkestan, 45 m. s.w. from Balkh; lat. 36° 21′ n., long. 66° 28′ e.; on a river which loses itself without reaching the Jihoon. It is cap. of an Uzbek chief. Pop. 18,000.

SIRIUS, n. *sĭr'ĭ-ŭs* [L. *sirĭus*, the dog-star—from Gr. *seirĭŏs*, hot, scorching: It. *sirio*], otherwise called *Canicula*, or the *Dog-star:* star of the first magnitude, the brightest in the heavens; in the constellation of *Canis Maior*, or the 'Great Dog.' It is about 125,716,000,000,000 miles (or 1,375,000 times the radius of the earth's orbit) distant from the earth: a ray of light (see LIGHT) from S. reaches the earth in about 21 years: see STARS. It has long been known to possess a 'proper motion' (i.e., an independent progressive motion), which was for a time believed to be in a straight line, but has now been shown to consist of an undulatory progressive motion on each side of a middle line. This motion was investigated by Prof. Peters of the Pulkowa Observatory, Russia, on the supposition that its anomalous character was produced by the attraction of some unseen neighbor, and his calculations being completed and verified (on this supposition) by Safford of

Washington, the distance of S. from the centre of gravity of both was determined to be 1,495 millions of miles. 1862, Jan., Alvan G. Clark of Cambridgeport, Mass., chancing to observe S. through a powerful telescope, detected a minute star (never before observed) at an angular distance of 7″ from S., representing about 4,300 millions of miles, and it is generally believed that this is the disturber in question. By photometric measurement it has been shown that, supposing the intensity of the sun's light for unit of surface to equal that of S., it would require 400 suns at the distance of S. to send us the light which that star does; and our sun at the distance of S. would appear less than a star of the sixth magnitude, and be invisible to the naked eye. S. appears to be one of the stars that change color: to the ancients it appeared as a red star; at present it is noticeable for brilliant whiteness. The Egyptians called this star Sothis, and at one time its 'Heliacal Rising' (q.v.) was a sure forerunner of the rising of the Nile; while among the Romans it was considered as a star of evil omen, whose appearance above the horizon coincided with (or even caused) the unhealthful and oppressive heats of summer. Hence the origin of the various superstitions regarding the Dog Days (q.v.), many of which are still current, e.g., that dogs are then liable to madness.—The term 'dog star' was applied also to Procyon, a bright star in *Canis Minor*, whose heliacal rising differs by only a few days from that of Sirius.

SIRKAR, n. *sėr'kėr:* a Hindu clerk or accountant; a circar; the government.

SIRLOIN, n. *sėr'loyn* [F. *surlonge,* a sirloin of beef—from *sur*, over; *longe,* a loin—a popular etymology is given in the story that the *loin* was sportively knighted by Charles II.]: a loin of beef.

SIRNAME: see Surname.

SIROCCO, n. *sĭ-rŏk'kō* [It. *sirocco;* Sp. *siroco,* the sirocco—from Ar. *sharq*, the east]: the hot parching wind which passes over the s. of Italy, Malta, and Sicily in the latter part of summer and autumn; supposed to originate in the Sahara or Great Desert of Africa. See Simoom: Harmattan

SIRRAH, n. *sĭr'ră* [a supposed but scarcely probable compound of *sir*, *ha*, or *ho:* Icel. *sira,* sirrah, a term of contempt]: a word used in anger, contempt, or reproach, sometimes in familiarity, in addressing.

SIRUP, n., more usually spelled Syrup, n. *sĭr'ŭp* [F. *sirop,* sweet juice—from Sp. *xarope,* a medicinal drink—from Ar. *sharab,* a beverage, syrup]: the juice of vegetables or fruit sweetened with sugar. Sir'uped, a. *-ŭpt,* moistened with sirup or sweet juice. Sir'upy, a. *-ŭp-ĭ,* like sirup, or partaking of its qualities.—See Syrup.

SIRVENTE, n. *sėr-vângt'* [F. *sirvente*—from L. *servīrĕ,* to serve]: *literally,* a poem of service; in the *middle ages,* a particular kind of poetry in common use among the troubadours.

SISAL HEMP, *sĭs'al hĕmp* (*Agave*): fibre-plant, of which there are many varieties. This name is applied to the fibre also. The fibre, known as Mexican grass, henequen, and by various other names, has been in common use since the time of the Aztecs, by whom it was employed. It is now being largely produced in and exported from Yucatan and Mexico, is coming into prominence in Cuba and the Bahamas, and is being grown experimentally in Florida. Plants were brought from Yucatan to Fla. 1836 and at later dates. Several patches now growing wild can be traced to plants set out at least 40 years ago.

The plant cannot be profitably grown above the frost-line. Though it can be produced in rather poor land, it gives much better returns in fertile soils. The land should be well plowed, and the plants set in rows about 12 ft. apart one way and 6 ft. the other. About 600 plants per acre will be required, Much closer setting is often practiced, but is not to be commended. Plants should be about 18 in. high when set, and should be put out during the rainy season. Weeds must be kept down by cultivation, and suckers should be promptly removed. The latter can be kept in the nursery till they are large enough to set in the field. A much more prolific source of supply is the flower-stalk or 'pole' of the mature plant, which grows 15 to 20 ft. high, and from which buds, which form plants, start after the flowers have fallen. Leaves for fibre should be not less than 3 ft. long. Such leaves can be obtained from plants in 3 to 5 years after they are set, and the size increases considerably with the age of the plant. A plantation remains productive 10 to 30 years, according to the cultivation and the climate. A fully grown plant should yield about 40 leaves, and from an acre of good land 1,000 to 1,500 lbs. of clean fibre should be obtained. Considerable machinery is needed to prepare the fibre for use. As it is injured less by dampness, the fibre makes better ropes than the true hemp. It is also largely used in manufacture of hammocks.

SISCO, *sĭs'kō*, properly CIS'CO (*Corregonus Hoyi*): one of the smaller Whitefishes, the genus giving name to a subfamily of *Salmonidæ*. It is called also Moon-eye, and is thus far found (at great depth) only in Lakes Michigan, Erie, and Ontario. It is small (seldom over ½ lb.) and rare, and is of little value.—The name is applied also in Ind. and Wis. to the Lake or Michigan Herring (*C. Artedi*), a valuable food-fish abundant in shallow waters of the Great Lakes and adjacent small lakes of the northwest.

SISCOWET, *sĭs'kō-wĕt*, or SISKAWITS, *sĭs'kaw-ĭts* (*Salvelinus namaycush*, var. *Siscowet*): variety or sub-species of the Lake Trout, found only in Lake Superior, and rare there as compared with the ordinary species. The Indian name is an Ojibewa word, meaning 'cooks itself,' the fish being so fat that it can be set on fire and made to cook itself. In the frying-pan it never requires pork-fat, like the drier common lake trout; in fact, it is too oily when fresh: but when salted and broiled, after long steeping in water, it is so delicious that it is consumed mostly in markets near its haunts. It was described first by Agassiz in *Lake Superior* (1850). To those familiar with it, it has enough peculiarities of shape and markings to be readily distinguished from the Namaycush. Unlike the latter, it is said to spawn at all seasons. The average weighe is 4½ lbs., the maximum about 30 lbs., half that of its congener.

SISKIN, n. *sĭs'kĭn* [Dan. *sisgen;* Norw. *sisk;* Sw. *siska*, a siskin: Dut. *sissen*, to twitter like small birds]: small singing-bird, of yellowish hue; a favorite cage-bird, allied to the Goldfinch, also to the Redpoll; also to the Yellow-bird of N. America

SISMOGRAPH, n. *sīs'mō-grăf:* see under SEISMOGRAPHY.

SISMOMETER: see SEISMOMETER (under SEISMOGRAPHY).

SISMONDI, *sĭs-mŏn'dĭ*, F. *sēs-mŏng-dē'*, JEAN CHARLES LEONARD DE: historian: 1773, May 9—1842, June 25; b. Geneva; of Italian descent. He studied at the 'College' or high school of Geneva; and then entered the university. His father's pecuniary reverses made it necessary for S. to quit the univ. and become a banker's clerk, at Lyon. During the French Revolution, S. took refuge in England, with his family; and 1795 they bought a small farm near Pescia, in Tuscany, where the smallness of their means rendered it necessary for S. almost literally to put his hand to the plow. He had now, however, leisure for literature. In 1798 he began to collect materials for his *History of the Italian Republics*. In 1803 appeared a work on political economy, *De la Richesse Commerciale*, in which he writes like a decided follower of Adam Smith, though at a later period, in his *Nouveaux Principes d'Économie Politique* (1819), he abandoned the views of his youth. The 16 vols. of his *Histoire des Républiques Italiennes* (1807–18) gave him a good rank among contemporary historians: it is now considered the best, though not the most extensive, of his works. In 1813 appeared his *Littérature du Midi de l'Europe* ('Literature of the South of Europe,' Eng. by Roscoe, frequently reprinted). In 1819 he began his greatest work, *Histoire des Français*, with which he was occupied until his death—publishing 29 vols. in 23 years. In the same year he married Miss Allen, an English lady, whom he had previously met in Italy: the marriage was a happy one. Thereafter he resided mostly in Geneva.—S. contributed more to historical literature than any other writer of his time, and the labor which he bestowed on his works can seldom have been surpassed. 'Nine times,' he says, 'have I traversed Italy, and I have visited every place which has been the scene of any great historical event.' For 20 years he worked habitually eight hours a day. Both as worker and thinker, he was thoroughly conscientious. He was deficient in intellectual acuteness and in breadth of grasp, and showed himself capable at times of being influenced by prejudice: his style, moreover, is not notable for vigor or precision; but he shows solid judgment, unflagging industry, and unwavering sincerity. Sainte-Beuve happily named him 'the Rollin of French history.' His private character was singularly amiable and benevolent.—See *Quarterly Review*, 1843, Sep.; *Vie et Travaux de Sismondi* (Paris 1845); also his Correspondence with Mademoiselle de St. Aulaire (Paris 1863), and his *Lettres Inédites à Madame d'Albany* (1864).

SIST, v. *sĭst* [L. *sistĕrĕ*, to cause to stand, to stop]: in *Scot. civil* and *eccles. law*, to stop; not to go further in the mean time; to cite or summon. SIST'ING, imp. SIST'ED, pp. TO SIST PROCEDURE, to delay judicial proceedings in a cause. TO SIST ONE'S SELF, to take a place at the bar of a court where one's cause is to be tried.

SISTAN', LAKE OF: see SEISTAN.

SISTER, n. *sĭs'tėr* [Goth. *swistar;* Pol. *siostra;* Dan. *söster;* Dut. *zuster;* Sw. *syster*, a sister: comp. Skr. *svasar*, she who pleases or consoles; *svasti*, joy, happiness: L. *soror*, sister]: a female born of the same parents as another person—the male is called a *brother;* a woman of the same faith or society: V. in *OE.*, to be sister; to resemble greatly. SIS'TERLY, a. *-lĭ*, like a sister; affectionate. SIS'TERLESS, a. *-lĕs*, having no sister. SIS'TERING, a. in *OE.*, allied; contiguous. SISTER-IN-LAW, n. a husband's or a wife's sister; a brother's wife. SIS'TERHOOD, n. *-hûd*, a society of females united in one faith or order. STEP or HALF SISTER, a sister by one parent only.

SISTERHOODS: religious associations of women. There are some grounds for believing that religious communities of women were found in the Christian Chh. earlier than communities of men; see I Tim. v. 9–12: Acts x. 39; see also the shorter version of the alleged letter of Ignatius to the faithful at Smyrna, in which mention is made of 'virgins who are called widows.' It is certain that when St. Anthony was about to embrace the anchoretic mode of life (about A.D. 300) he placed his sister in a 'Parthenōn,' or convent of virgins. The writings of Tertullian (b. 160) and Cyprian (b. 200) are full of exhortations addressed to women vowed to perpetual virginity: and in their time monastic orders of women must have been numerous. Pachomius, the first lawgiver of the cenobites, induced his sister to establish a community of virgins vowed to observe the same rule of life which governed the communities (cœnobia) of men founded by him on the island of Tabennæ in the Nile. That rule distributed the inmates into cells, each containing three cenobites: here they lived remote from the world, practicing austerities of every kind, living on the scantiest fare, tilling the ungrateful soil of the Egyptian deserts to supply their simple wants: these cœnobia of virgins were founded in the first half of the 4th c. From the land of the Nile the rule of St. Pachomius was carried into Syria and Palestine, Armenia, Asia Minor, and Italy; and thence it spread over the whole West. In Egypt alone, in the 5th c., of 100,000 cenobites living under the Pachomian rule, one-fourth were women. In the East the rule given by St. Basil (d. 379) superseded the rule of St. Pachomius, and the Basilian rule persists to this day without essential modifications. In the West the rule of St. Benedict (d.543) supplanted that of Pachomius; but before Benedict's day, Jerome (d. 420) and Augustine (d. 430) had founded convents of nuns with monastic codes differing from that of Pachomius. Benedict's sister Scholastica brought together a number of women under the Benedictine rule, and to this day her spiritual progeny exist in the Roman Chh. Many of the reformers of the great Benedictine order—Benedict of Aniane, Berno of Cluny, Robert of Molesme (founder of the Cistercians), and others—established convents of women governed by substantially the same rules that they formulated for convents of monks. In like manner the founders of the Austin Canons, the Premonstratensians, and even of the military orders—Templars, Hospitalers, Knights of St. John of Jerusalem, etc.—instituted communities of women affiliated to those orders; the rule of the women's convents attached to the military orders obligated the sisters to serve in lazar-houses, hospitals, etc.: this was the first step toward the institution of congregations of religious women expressly for performing works of mercy and charity, and not simply for practice of asceticism and for the exercises of the contemplative life. The 13th c. saw the rise of the orders of 'friars'—the mendicant orders, Franciscans and Dominicans, with convents for both sexes. The congregation of the Sisters of Charity, or Daughters of Charity, founded 1634 by St. Vincent de Paul, is the model after which have been fashioned most of the congregations of women established since. The spirit of St. Vincent's rule is seen in the memorable words that he addressed to his spiritual daughters: 'Your convent must be the house of the sick; your cell, the chamber of suffering; your chapel, the parish church; your cloister, the streets of the city, or the walls of the hospital; your rule, the general vow of obedience; your grille, the fear of God; your veil to shut out the world, holy modesty.' Many other orders or congregations of women have been instituted in the Roman Chh. since the time of Vincent de Paul, nearly all of them for the performance of works of mercy and charity. There are several congregations known as Sisters of Charity that are not under the rule of St. Vincent de Paul.—In the United States the congregation of Sisters of Charity founded by Mrs. Seton (q.v.) was originally an independent organization; but about 1860 the mother-house at Emmittsburg, Md., was aggregated to the central organization in France, and adopted the rule and habit of the Filles de la Charité. But in several dioceses the sisters there 'on mission' elected to retain their original rule and habit, and to remain subject only to the diocesan ecclesiastical authorities. The following table shows the names and date of institution of at least all the most notable sisterhoods that have existed either in the e. or the w. chh., including the Protestant sisterhoods:

RELIGIOUS SISTERHOODS.

[Many of the dates, particularly the earliest, are approximative only. The names of founders are given in parenthesis.]

Date.	
350	Tabennites (Pachomius).
365	Basilian nuns (St. Basil).
530	Benedictines (St. Benedict).
641	Nuns of Nivelles, Flanders.
910	Benedictines of Cluny (Berno).
1060	Augustinians.
1098	Cistercians (St. Robert of Molesme).
1120	Premonstratensians (St. Norbert).
1173	Beguines (Lambert le Bèghe).
1200	Penitents of St. Mary Magdalene.
1209	Carmelites (Berthold).
1212	Nuns of St. Clare (St. Francis and St. Clara).
1215	Dominicans (St. Dominic).
1363	Brigittines (St. Briget of Sweden).
1390	Hieronymites (Maria Garcias)
1433	Oblates (St. Frances of Rome).
1443	Daughters of St. Martha, Hospitallers.
1453	Madelonettes.
1493	Filles Repenties (Jean Tisserand)
1503	Annonciades (Jeanne of Valois).
1525	Capuchines.
1537	Ursulines (Angela de' Merici).

SISTERHOODS.

1568 Discalced Carmelites (St. Theresa).
1596 Notre Dame de St. Paul.
1608 Jacobines, or Reformed Dominicans.
1610 Nuns of the Visitation (Jeanne Frances de Chantal)
1611 French Ursulines.
1617 Hospitallers of St. Charles.
1618 Nuns of Calvary.
1624 Hospitallers of the Charity of Our Lady.
1624 Nuns of Our Lady of Refuge.
1625 Religieuses de la Croix.
1629 Sisters of Charity (St. Vincent de Paul).
1633 Order of Mercy.
1639 Sisters of the Blessed Sacrament.
1641 Nuns of the Good Shepherd (Madeleine l'Amy)
1643 Daughters of Providence.
1650 Sisters of St. Joseph.
1653 Benedictines of Perpetual Adoration.
1660 Hospitaller Nuns of St. Thomas of Villanova.
1678 Sisters of the Child Jesus.
1679 Daughters of Providence.
1684 Sisters of the Presentation.
1686 Ladies of St. Cyr (Mme. de Maintenon).
1686 Daughters of the Good Shepherd.
1704 Sisters of Charity of St. Paul the Apostle.
1712 Congregation of the Good Saviour.
1713 Religious of the Blessed Sacrament.
1732 Redemptorists (St. Alfonzo de' Liguori)
1800 Ladies of the Sacred Heart.
1801 Dames de St. André.
1816 Sisters of Jesus and Mary.
1820 Sisters of Notre Dame.
1820 Sœurs de l'Espérance.
1822 Faithful Companions of Jesus.
1824 Sœurs de Bon Secours.
1824 Marist Sisters.
1827 Sisters of Mercy (Catherine McAuley).
1833 School Sisters of Notre Dame.
1833 Daughters of the Cross.
1836 Deaconesses* (Theodor Fliedner).
1840 Deaconesses.†
1840 Little Sisters of the Poor.
1842 Deaconesses* (Pastor Harter).
1842 Deaconesses of St. Loup.‡
1843 Sisters of Notre Dame de Sion.
1846 Society of the Holy Child Jesus.
1847 Society of the Holy Trinity.§
1848 Sisters of the Poor Child Jesus.
1849 Poor Handmaids of Jesus Christ.
1849 Sisters of St. Mary the Virgin.§
1850 Sisters of the Most Holy Cross and Passion.
1851 Sisters of Nazareth (Cardinal Wiseman).
1851 Sisterhood of All Saints.§
1852 Deaconesses of Richen.‡
1854 Society of St. John the Baptist.§

** Lutheran.* † *French Reformed.*
‡ *Swiss Reformed.* § *Chh. of England.*

1855 Nursing Sisters of St. Margaret.§
1856 Helpers of the Holy Souls.
1861 Deaconesses.§
1861 Sisterhood of St. Peter.§
1861 Congregation of the Finding of Jesus in the Temple.
1864 Little Sisters of the Assumption.
1865 Sisterhood of St. Mary.§
1866 Sisters of Bethany.§
1869 Sisterhood of the Good Shepherd.§
1870 Sisters of the Church.§
1870 Little Company of Mary.

In the United States there were (1891) in the Prot. Episc. Chh. the following sisterhoods: Sisterhood of St. Mary, with houses (schools) in New York, Peekskill, N. Y., Memphis, Tenn., besides hospitals and retreats in sundry places. Sisterhood of the Holy Communion, conducting a training school, home for aged women, babies' shelter, and shelter for girls: all in New York. Sisterhood of the Good Shepherd, conducting training schools, etc , in several parishes in New York and St. Louis, in N. J., Tenn., and elsewhere. Sisterhood of St. John Baptist, with a number of houses in New York, and one in South Amboy, N. J. Sisterhood of the Holy Child Jesus, at Albany, N. Y.; of St. Margaret, Boston and other cities; of St. John Evangelist, Brooklyn; of Sts. Philip and James, New Orleans; of St. Martha, Louisville, Ky.; of the Holy Nativity, Providence, R. I.; of the Holy Name, Texas; All Saints Sisters of the Poor, Baltimore; Sisters of St. Mary and All Saints, Baltimore; Order of Deaconesses of the Diocese of Ala.; Grace Training School for Deaconesses, New York. There are sisterhoods in every Rom. Cath. diocese and vicariate apostolic of the United States. —For some of the prominent sisterhoods in the foregoing list, see their respective titles.

SISTINE, a. *sĭs'tĭn:* of or pertaining to Pope Sixtus V., as the Sistine Chapel in the Vatican at Rome.

SISTOVA, *sĭs-tō'vâ:* important commercial town of the principality of Bulgaria, on the s. bank of the Danube, about 35 m. above Rustchuk. It has several mosques, an ancient and strong castle, where the 'peace of Sistova' between Austria and Turkey was concluded 1791; manufactures cottons and leather, and has active river-trade. More than half the people are Bulgarians; the rest Turks, Walachians, and Gypsies. Pop; (1887) 12,482.

SISTRUM. n. *sĭs'trŭm* [L. *sistrum;* Gr. *seistron,* a sistrum, a metallic kind of rattle—from Gr. *seiein,* to shake: It. *sistro:* F. *sistre*]: a musical instr. used by the anc. Egyptians in the worship of Isis, consisting of a thin oval metal frame, through which passed loosely a number of metal rods, and furnished with a handle.

SISUPÂLA, *sĭs-ô-pâ'la:* in Hindu legend, sovereign of Chedi, a country in central India; the enemy of Krishna (q.v.), and ultimately slain by him. The history of this enmity, and the death of S., are the subject of the *S'is'u-pâlabadha* of Mâgha: see SANSKRIT LITERATURE.

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§ Church of England.

SISYPHUS, n. *sĭs'ĭ fŭs* [L. *Sis'yphus;* Gr. *Sis'uphos,* Sisyphus]: in *anc. myth.*, son of Æolus, founder and king of Corinth, famous—with his whole house—for cunning and robberies: he was killed by Theseus, and condemned by Pluto in the infernal regions to roll an immense rock from the bottom of a hill to its summit. The rock, whenever it neared the top, rolled down again, thus making his task endless. He was said to have murdered travellers with a huge block of stone. SIS'YPHE'AN, a. *-fē'ăn,* or SISYPHIAN, a. *sĭs-ĭf'ĭ ăn* [L. *sisyph'ius,* of or belonging to Sisyphus]: relating to Sisyphus; incessantly recurring; fruitless, as labor.

SIT, v. *sĭt* [AS. *sittan*, to sit: Ger. *sitzen;* Dan. *sidde;* Icel. *sitia*, to sit: L. *sidĕrĕ*, to seat one's self]: to rest on the lower part of the trunk of the body; to be in a state of rest or idleness; to settle or abide; to be in any situation or condition; to cause to be seated; to incubate; to brood; to be adjusted or fit; to be convened, as an assembly; to hold a session; to exercise authority; to be in any local or official position; to represent in parliament, as he *sat* for Edinburgh; to rest on or bear, as applied to grief, weight. SIT'TING, imp.: N. the act of taking, or posture of being on, a seat; a seat or place, as in a church; the actual meeting of any body of men; the time for which one sits, as to a portrait painter, at play, etc.; the time or course of uninterrupted study or sedentary labor, as, at one *sitting;* session, as of a court of law or parliament; incubation. SAT, or SATE, pt. *săt.* SAT, pt. pp. *săt,* sometimes SITTEN, pp. *sĭt'n.* SIT'TER, n. *-tėr,* one who sits; a bird that broods. To SIT DOWN, to place one's self on a chair or seat; to settle; to fix one's abode; to be seated: to begin a siege. To SIT FOR A PORTRAIT, to assume, for a limited time, a proper position to allow one's portrait to be painted by an artist. To SIT OUT, to remain till all is done. To SIT UP, to rise from a recumbent position; not to go to bed.

SÎTÂ, *sē'tâ:* in Hindu mythology, daughter of Janaka, King of Mithilâ, and wife of Râma: see VISHN'U. Sîtâ means 'furrow,' as she was not born, but arose from a furrow when her father was plowing the ground, whence she is called also *Pârthivî* [from *pr'thivî,* the earth]. She is the heroine of the RÂMÂYAN'A (q.v.).

SITE, n. *sīt* [F. *site*—from L. *situs,* position: It. *sito*]: the place where anything is fixed; local position; situation; spot; ground-plot. SITED, a. *sīt'ĕd,* in *OE.*, placed; situated.

SITFAST, n. *sĭt'făst* [*sit*, and *fast*]: an ulcerated horny sore growing on a horse's back under the saddle: ADJ. immovable; stationary.

SITH, conj. *sĭth:* OE. for SINCE; seeing that.

SITHE, n. *sīth* [AS. *sith,* time]: in *OE.*, time.

SITHE, n. *sīth* [see SCYTHE]: in *OE.*, a scythe: V. to cut down with a scythe. SITHED, a. *sīthd,* armed with scythes.

SITIOLOGY, n. *sĭt′ĭ-ŏl′ŏ-jĭ*, or Sitology, n. *sī-tŏl′ŏ-jĭ* [Gr. *sition*, *sitos*, food; *logos*, a discourse]: in *phys.*, the doctrine or consideration of aliments; dietetics.

SITKA, *sĭt′ka*, or Novoarkhangelsk, *nō-vârk′âng-ghĕlsk′* (New Archangel): village, cap. of Alaska Terr.; on the w. coast of Baranoff or Sitka Island, and on the Pacific Ocean; lat. 57° 3′ n., long. 135° 18′ w. It has a small but safe and beautiful harbor, protected from the sea by Mount Edgecombe, nearly surrounded by lofty mountains, and studded with numerous small islands. For many years it was the headquarters of the Russo-American Fur Co. and was known as *New Archangel.* Since the cession of the terr. by Russia to the United States (1867), capitalists, chiefly of Cal. and Or., have done much toward developing the four distinct resources of the terr., furs, fish, minerals, and timber. The village contains the remains of the palace of former Russian governors, stoutly built and richly decorated; the old Russo-Greek church, built in the form of a Greek cross, surmounted by a copper-covered dome and chime-bell tower, with interior decorations and altar-furnishings in solid gold and silver, and gold embroidery, and a copy of the *Madonna and Child* from Moscow, in which all parts excepting the faces are executed in gold and silver metal; an old castle, on the rocks overlooking the harbor, built of logs riveted with copper; U. S. custom-house; U. S. milit. station; Presb. mission chapel, school, and hospital; several commercial buildings; and one weekly newspaper. The water-supply is from Indian river. The scenery in the village and its environments is rendered curiously attractive by the many native domiciles with grotesque totem-poles in front. Contrary to the popular impression, the temperature of S., by reason of its location on the sea near the warm current from the s. Pacific, is comparatively mild. During 1881–88 the summer extremes of the thermometer were 79° and 70°; winter 15° and 3°; mean winter temperature 31·1°—36·8°; mean through year 43° 45′. During the year ending 1903, June 30, the imports of merchandise into the terr. were $477,463, and the dom. exports $1,612,128. Pop. of S. (1890) 2,078, of whom 1,188 were whites, 31 Chinese, 859 Ind.; (1890) 1,396.

SITOPHOBIA, *sī-tō-fō′bĭ-a*, or Sitiophobia, *sĭt-ĭ-ō-fō′bĭ-a:* repugnance to or refusal of food, ranging from mere impairment or loss of appetite, or hysterical antipathy to particular viands, to total and prolonged abstinence, as a symptom of delusion or delirium. In the insane, food has been consistently refused for years. During this time, the system was, of course (see Fasting), sustained by compulsory alimentation. The causes are usually local disease in the organs of digestion, associating suffering with the process of nourishment; also, sometimes fear of, or desire for death. According to the mental state predominating, suicide may be courted; or poisoning, drugging, or pollution of aliment may be dreaded; the throat or bowels may be imagined hermetically sealed; God or Satan may have imposed abstinence; the body is dead, inanimate, or belongs to another. These absurd delusions prove inexpugnable to persuasion, or to the pangs of hunger, and require special treatment. The determination may be exorcised by medicine, it may be overcome by commands, threats, bribes; it may be evaded by giving eggs, cocoa-nuts, milk from the cow, and other substances, into which the dreaded poisons or pollutions cannot be introduced; or it may be defeated by placing food in the stomach by means of the stomach-pump. There have been epidemics of maniacal abstinence.—Chipley, *American Journal of Insanity*, 1859, July; Browne, *Report Crichton Institution* 1854.

SIT′TA: see Nut-hatch.

SITUATED, a. *sĭt′ū-ā-tĕd*, or Sit′uate, a. *-āt* [mid. L. *situātus*, located—from L. *situs*, situation, local position: It. *situato*, situated]: permanently fixed; placed with respect to any other object; being in any state or condition with respect to others. Sit′ua′tion, n. *-ā′shŭn* [F.—L.] position; location in respect to something else; state or condition; temporary state; circumstances; place or office, as, in a *situation*.—Syn. of ‘situation’: site; station; post; condition; state; position; predicament; plight; ease; seat; place; office; circumstance; posture; attitude; locality.

SITUS, n. *sī′tŭs* [L. *situs*, situation]: in *bot.*, the peculiar mode in which parts are disposed, as well as the position they occupy.

SITZ-BATH, n. *sĭts-bâth* [Ger *sitz-bad*—from *sitz*, a seat; *bad*, a bath]: a sort of tub for bathing in a sitting posture; hip-bath.

SIVA, *sē′vâ* [Skr., happy, auspicious]: in Hindu mythology, the third god of the Hindu Trimûrti (q.v.) or triad, in which he represents the principle of destruction. The name S., as that of a deity, is unknown in the Vedic hymns, but established as such in the epic poems, *Purân′as* and *Tantras*. The worshippers of S. (see S′aivas) assign to him the first place in the Trimûrti; and to them he is not only the chief deity, but the deity which comprises in itself all other deities. Thus, in the *S′iva-Purân′a* (see Purân′a), he is addressed as Brahma, Vishn′u, Indra, Varun′a, as the sun and the moon, as earth, fire, water, wind, etc.; but even in the Purân′as relating to Vishn′u, his power is exalted in praise, and he is addressed with utmost awe. The symbol of S. is the *Linga* (q.v.), emblematic of creation, which follows destruction. From each of his numerous attributes or characteristics he derives a name or epithet. He has five heads (hence his name *Panchânana*, etc., the five-faced); three eyes (hence his name, *Trinetra*, etc., the three-eyed), one of which is on his forehead, and indicates his power of contemplation; and in the middle of his forehead he wears a crescent. His hair is clotted together, and brought over the head so as to project like a horn from

Siva.

the forehead. On his head he carries the Ganges; whose course he intercepted by his hair, when this river descended from heaven, so as to enable the earth to bear its fall (hence his name, *Gangâdhara*, etc., the Ganges-bearer). Round his neck he carries a garland of human skulls; and his throat is dark blue, from the poison swallowed when it emerged from the ocean. In his hands he holds the trident, a club or pole, armed at the upper end with transverse pieces, representing the breastbone and ribs adjoining, and surmounted by a skull and one or two human heads. His weapons are the *Khinkhira* (not described), a bow, thunderbolt, and axe. As the destroyer of the world, he is called also *Kâla* (Time or Death), and represented as of black color. One of his representations is also half-male and half-female, emblematic of the indissoluble unity of the creative principle (hence his name, *Ardhanârîs'a*, the half-female lord). He resides on the wonderful mount Kailâsa, the n. peak of the Himalaya, where he rules over the n.e. quarter. His principal wife is *Durgâ* or *Umâ* (q.v.); his sons are GANES'A and KÂRTTIKEYA (q.v.) S. is the patron of dancers, and is called *Nat'es'wara* (lord of the dancers). A host of attendants, with demons and other beings surrounding him, are named by the Purân'as.

Among the principal achievements of this god is his conflict with the god Brahma, who was originally possessed of five heads, but lost one through exciting the anger of S.; for the fifth head of Brahma, once disrespectfully addressing S., and even challenging his power, S. immediately cut off the offending member with the nail of his left thumb. A similar penalty he inflicted on *Daksha,* his father-in-law, who once performed a great sacrifice, but neither invited his daughter Satî nor her husband S'iva. S., nevertheless, appeared at the sacrifice; but when Satî, offended at the reception she met with, threw herself into the sacrificial flames, S. cut off the head of Daksha; and Daksha would have remained headless, had not the gods interfered in his favor with S., who, out of compassion, replaced his head by that of a ram. Besides these feats, he killed several demons—*Ruru*, *Andhaka*, *Tripura;* and he also reduced to ashes *Kâma*, the god of love (see KÂMA). S. is worshipped especially under the symbol of the Linga; but there are periods at which homage is paid to him under other forms as described above. Hindu mythology knows, properly speaking, no incarnations of S. like those of Vishn'u; in some writings, however, some of his forms, especially that called Bhairava, and that called Vîrabhadra, are considered his sons or incarnations. S , like Vishn'u (q.v.), has a thousand names by which he is addressed; some derived from his exterior attributes have been mentioned above; among the rest, the principal are *Is'a* or *Is'wara* (lord); *Mahes'a* or *Mahes'wara* (great lord); *S'ankara* (conferrer of happiness), *Rudra* (the terrible), or *Mahârudra* (the very terrible); and *Mahâdeva* (the great god). For his worshippers, see S'AIVAS.

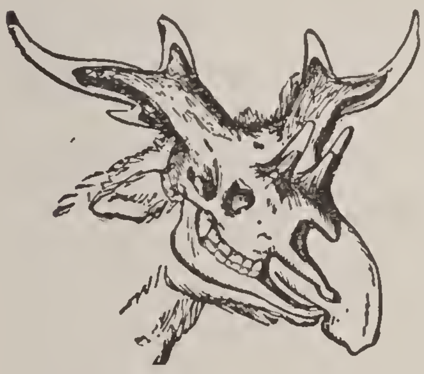
SIVALIK, or SIWALIK, n. *sĭ-vâ'lĭk*, or SEWALIK, n. *sĕ-vâ'lĭk* [from *Siva*]: range of Indian hills, otherwise called the Sub-Himalayas, running parallel to the main chain, and generally consisting of two ranges separated by a broad valley, the s. slope overlooking the Ganges.

SIVAN, n. *sī'văn:* third month of the Jewish ecclesiastical year, including parts of May and June.

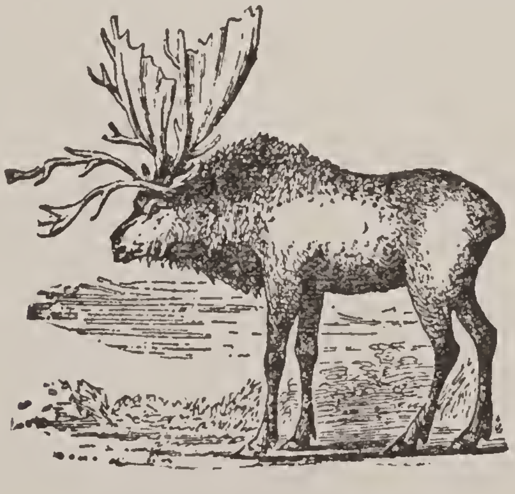
SIVAS, or SIWAS, *sē-vâs':* city of Asiatic Turkey, cap. of the pashalic of S., on the Kizil Irmak (anc. *Halys*), 60 m. s.s.e. of Tokat; 4,670 ft. above the Black Sea. S. is named from the anc. *Sebasteia,* on whose site it is built. It covers a large extent of ground, is well built, has numerous old mosques, khans, gardens, and excellent bazaars, manufactures coarse woolens; and has considerable transit trade. Pop. estimated 25,000, of whom about 5,000 are Armenians, the rest Turks.

SIVASH', or PUTRID SEA: see CRIMEA.

SIVATHERIUM, *sĭv-â-thē-rĭ-ŭm* [*Siva* (q.v.), Indian god; and Gr. *therion,* a wild beast]: remarkable genus of extinct mammals, found in the Miocene strata of the Sewalik Hills, n. India. The species found there, *S. giganteum,* had a large skull, nearly as long as that of an elephant, supported on a neck little short of that of a giraffe, but much stronger. The face was short, and the nasal bones were prolonged into a pointed arch above the external nostrils, indicating the existence of a trunk or proboscis, an organ unknown among the Ruminantia to which it belonged. Like the existing 4-horned antelope of India, it had two small diverging horns, rising from the brow between the orbits, and two large, probably palmated horns, further back. In general appearance, it resembled a huge antelope. By some naturalists, the family *Sivatheriidæ* has been united with the *Giraffidæ;* by others with the *Antilocapridæ* of N. America.



Skull of Sivatherium.



Sivatherium (restored).

SIVER, n. *sĭv'ėr* [OF. *essuy,* dried: W. *sych,* dry; *sychu,* to dry: Gael. *sùgh,* moisture: O. Ger. *suyveren,* to cleanse: connected with SEWER, which see]: in *Scot.,* a covered drain; a sewer; applied also to the grating and trap on a street-drain, in which case it might be derived from *sieve* [Dan. *sie,* to percolate, to sink in: Norw. *sika,* to drain off moisture: see SILE].

SI'WAH, or EL-SI'WAH: see AMMONIUM.

SIX, n. *sĭks* [L. *sex;* Gr. *hex;* Goth. *saihs;* Dut. *zes;* Dan. *sex;* Gael. and Ir. *se;* Skr. *shash,* six]: the next in number after five; as a prefix, having six. SIXFOLD, a. six times repeated. SIXPENCE, n. an Eng. silver coin, in value six pennies; half a shilling. SIXPENNY, a. worth sixpence. SIX-SCORE, n. in number, 120; six times twenty. SIX'TEEN, n. *-tēn* [AS. *sixtine,* six + ten, sixteen]: six and ten; the number after fifteen. SIX'TEENTH, a. *-tēnth,* the ordinal of sixteen: N. one of sixteen equal parts. SIXTH, a. *sĭkth,* the ordinal of six: N. the sixth part; one of six equal parts; an interval in music. SIXTH'LY, ad. *-lĭ,* in the sixth place. SIXTY, n. *sĭks'tĭ* [AS. *sixtig,* six × ten, sixty]: six times ten; the next after fifty-nine. SIX'TIETH, a. *-tĭ-ĕth,* the ordinal of sixty: N. one of sixty equal parts. SIXTH-RATE, one of the smaller British war-vessels. TO BE AT SIXES AND SEVENS, to be in a state of utter confusion and disorder. ON THIS DAY SIX MONTHS, terms used in the motion of a member in the house of commons to the effect that a bill be indefinitely postponed—since at the date named parliament will not be sitting.

SIX ARTICLES, STATUTE OF: enactment in the 31st year of Henry VIII., passed 1541, June 7, and commonly called the Bloody Statute. Its object was to compel, from all the subjects of the crown, the uniform profession of certain doctrines, six in number, carefully specified in the act. These are (1), the Real Presence of Christ in the Eucharist, and Transubstantiation; (2), sufficiency of communion in one kind only; (3), unlawfulness of the marriage of priests; (4), obligation of vows of chastity; (5), propriety of retaining private masses; (6), expediency and necessity of auricular confession. The penalties of this act exceeded in severity almost every precedent, at least in England; they were severe especially against impugners of the first article—all of whom, whether they dispute, write or preach against it, were to suffer death as heretics, with forfeiture of all their goods to the crown, and without being allowed to abjure the error. With regard to the remaining five articles, the usual penalty of felony is attached to the crime of publicly preaching against them; private impugners are liable for the first offense to imprisonment at the king's pleasure, for the second offense to death; and the same, or nearly the same penalties are enacted against priests or nuns marrying or cohabiting, and against persons contemptuously refusing to confess at the prescribed times, or to receive the sacraments. The act at first was enforced with great severity, but was somewhat mitigated 1544, and was repealed in the first year of the reign of Elizabeth.

SIX NATIONS: confederation of aboriginal Indian tribes inhabiting central and w. New York; known also as Iroquois. The confederation comprised at first 5 nations: Mohawks, Oneidas, Onondagas, Cayugas, Senecas: the Tuscaroras were admitted 1713. The confederation existed at least as early as 1609, when a force of Iroquois suffered defeat at the hands of Champlain and his Huron allies. They made frequent expeditions into Canada 1621–55, and almost obliterated their ancient enemies the Hurons. After the English occupation of New York, the S. N. were the allies of the English in warring against the Illinois, Miamis, and Ottawas; in the war of the revolution they were still on the side of Britain: the Wyoming massacre was the work of these savage allies. There was retaliation 1779, when Gen. Sullivan laid waste their w. cantons. At the conclusion of peace the Iroquois migrated in great numbers to Canada where reservations were assigned them. There are (1902) on reserva. in the state of N. Y. 5,318 Indians belonging to the S. N., and in Canada more than 7,000.—The federal polity of the S. N. was somewhat like that of the United States. The people were agriculturists. Each of the nations was divided into tribes, each tribe governed by a 'sachem' elected by the members of the tribe. A head sachem, chosen by the tribes, with a council of seniors, administered the affairs of the federation. Neither the pres. nor the council received any pay or remuneration: the honor of serving their people in the highest post was deemed sufficient recompense. Among the great captains and great councillors of the S. N. were Garakonthie, Dekanisora, Tawerahe, Hendrick, Cornplanter, Farmer's Brother, Brant, Red Jacket, Ganeodiyo (prophet and reformer). For history of the S. N., see Cusick's (a Tuscarora) *Hist. of the S. N.;* Morgan's *League of the Iroquois.*—Also, see Indians, American: Indian Territory.

SIX-PRINCIPLE BAPTISTS: see Baptists, Six-principle.

SIXTEENMO, n. *sĭks-tēn'mō*, or Sexto-decimo, n. *sĕks'tō-dĕs'ĭ-mō* [L. *sextus-decĭmus*, the sixteenth—from *sextus*, the sixth; *decĭmus*, the tenth]: among *printers*, a sheet folded into sixteen leaves, or thirty-two pages, usually abbreviated into 16mo.

SIXTUS IV., *sĭks'tŭs* (Francesco della Rovere), Pope of Rome: 1414, July 21—1484, Aug. 13 (pope 1471–84); b. near Savona, Italy; of humble family. He was a scholar of the celebrated Cardinal Bessarion, and became a member of the Franciscan order, in which capacity he obtained high reputation throughout Italy as a preacher. On the death of Paul II. 1471, Rovere was elected to the Roman see. The domestic government of S. has been strongly condemned. His inordinate partiality to his relatives exhausted the papal treasury, and led to many questionable exactions, and to gross abuses in the dispensation of church patronage. His excessive facility, too, in dispensing favors, led to his frequently conferring the same benifice on more than one individual. But the worst imputation on the memory of his pontificate arises in connection with the political affairs of Florence, especially with the conspiracy against the Medici family, known as the Pazzi conspiracy. In the last act of this nefarious plot, the murder of Giuliano in the church at Florence, S.'s nephew, the prodigal Cardinal Riario was present; and when, after its failure, the leaders, including the Abp. of Pisa, were put to death, S. excommunicated the Duke Lorenzo and all the magistrates of Pisa. Although this censure was passed professedly for the violation of the immunities of the church in putting an ecclesiastic to death, yet it has drawn on S. the suspicion of complicity, or at least of connivance after the fact; and has led to much controversy among historians. The necessities of defense against the Turkish invasion embarrassed still further the finances of the pope, and even Rom. Cath. historians deplore the lengths to which ecclesiastical exactions and the simoniacal distribution of benefices were carried in the latter years of Sixtus. In many respects, nevertheless, his administration was liberal and public spirited. Though not guarding the public treasure from plunder by his relatives, he was without avarice in his own behalf. He did much to foster learning and to encourage art, rewarding scholars and painters; he gained the name of second founder of the Vatican library; and he contributed notably to the improvement and decoration of the city, establishing hospitals, building and endowing churches, constructing the Sixtine Chapel and the Sixtine bridge. In 1482 he entered into an alliance with the Venetians against the Duke of Ferrara, which led to a general Italian war, and ended in a dissolution of the Venetian alliance; thus causing 'the scandal to be witnessed of the secular princes and cities of Italy agreeing to a peace which the Father of Christendom did his best to thwart.' His death is said to have been caused by mortification at the result.

SIX'TUS V. (Felice Peretti), Pope of Rome: 1521, Dec. 13—1590, Aug. 27 (pope 1585–90); b. near Montalto, Fermo, Italy; of parents so poor that the legend is that his boyhood was spent in the occupation of a swineherd. A conventual Franciscan father procured the boy's admission into the order. He was ordained priest 1545, and became prof. of theology at Rimini and at Siena. His reputation as preacher led to his being transferred to Rome, where he rose to its first dignities: he became inquisitor-gen. at Venice, and theologian at the council of Trent. He acompanied Cardinal Buoncompagno as theologian in his legative mission to Spain (1565); and on the accession of Pius V. to the pontificate, was made Cardinal Montalto (1570). On the accession of his former patron, Buoncompagno, as Pope Gregory XIII., Cardinal Montalto might have exercised the highest influence; but he went into retirement, and was believed to have fallen almost into the decrepitude of age and infirmity. This appearance was afterwards ascribed by his enemies to design and as concealing his ambitious views; and there is a well-known though apocryphal story of his having, when elected pope on the death of Gregory, flung aside his crutch, and revealed himself to the astonished and disappointed cardinals in the full vigor of body, mind, and will. His pontificate certainly was most active and energetic, and was marked by vigorous measures of improvement in every department of administration, ecclesiastical and civil. His first care was to repress the prevailing license and disorder of the city of Rome and of the papal states generally, by exterminating the bands of outlaws by which both were infested. His administration in the repression of immorality was stern and even terrible; but the evil was one which demanded even seemingly cruel remedies. He reformed the administration of the law, and the disposal of public patronage; he entered upon numerous and most comprehensive projects for the moral and material improvement of Rome. Many of his great works are still recognizable at Rome under his name; among which are the library buildings of the Vatican, and the supply of Rome with water. A characteristic of his administration, too, was its disinterestedness: he steadfastly refused to use his position for advancing any of his relatives, or to bestow on them property or money derived from the public; and he secured within the first years of his short pontificate a surplus of more than 5,000,000 of crowns in the exchequer previously empty; this end was gained, however, in part by sale of offices and by an excessive taxation, and with the result of impoverishment of the community. In foreign policy, his great aim was, in the strongest sense of the words, to advance the Rom. Cath. Church in every portion of Christendom, against the Huguenots in France, against the Lutherans in Germany, and against Queen Elizabeth in England. At the same time, he entertained deep jealousy and apprehension of the designs of Spain; and he resisted the excessively rigorous measures of the Spanish Inquisition as organized under Philip II. His church administration was equally vigorous and energetic. He fixed the number of the Sacred College of Cardinals at 70; and it was under him that the present organization of separate congregations of cardinals for the several departments received some of its most important developments. S. published a new ed. of the Septuagint, and an ed. of the Vulgate, which has become famous from the multiplicity of its errors, subsequently corrected in the edition of Clement VIII.

On the whole S. was one of the most remarkable men in the modern pontificate—an austere but just magistrate—with genius of high order, usually practical, though at times visionary; and acting with little regard for, and indeed little need of, advice from others. The assertion that he died by poison has not sufficient evidence.—Many of the popular stories regarding S. are derived from Gregorio Lete's *Vita di Sisto V.* (2 vols. Lausanne 1669) a work of no authority. See also Tempesti, *Storia della Vita e Gesti de Sisto V.* (2 vols, Rome 1754); Lorentz, *Sixtus V. und seine Zeit* (Mainz 1852); Ranke, *Fürste und Völker von Süd-Europa,* and Von Hübner, *Sixtus V.* (1874).

SIZAR, *sī'zėr*, or Sizer [see Size 1]: name given to an order of students at Cambridge Univ., and at Trinity College, Dublin, who receive free commons and free tuition. Duties somewhat menial were originally required of the sizars, but these have long since gone into disuse. Sizars are not on the foundation, and therefore so long as they remain such are not eligible for fellowships; but they may at any time become pensioners, and generally sit for scholarships immediately before taking their first degree. If successful, they are on the foundation, and may become candidates for fellowships when they have taken their degree.—At Oxford there is a similar order of students, denominated Servitors.

SIZE, n. *sīz* [contr. of OE. *assize*, a statute regulating the measure and price of commodities (see Assize)]: *literally*, a settled portion of bread; hence, extent of bulk; comparative magnitude; largeness. Size, or Si'zing, n. at *Cambridge University*, food and drink from the buttery in addition to the regular commons: V. to arrange according to bulk or size; to have extra food from the buttery. Si'zing, imp. Sized, pp. *sīzd:* Adj. having a particular magnitude, as large-*sized*, common-*sized*. Sizable, a. *sī'ză-bl*, of large bulk; of suitable size. Si'zar, n. *-zėr* [OE. *assize*, corrupted into *size*, settlement or arrangement, hence the ordinance for regulating the sale of bread or of fuel, an allowance]: student at a univ. who usually receives food and tuition free, and who formerly waited on the high table at meals (see Sizar). Si'zarship, n. *-shĭp*, condition of a sizar.—Syn. of 'size, n.': bulk; magnitude; greatness; dimension; bigness; largeness.

SIZE, n. *sīz* [It. *assisa*, size—from *assidere*, to situate—from L. *assidĕrĕ*, to sit near: Sp. *sisa*, a kind of glue that painters use]: weak soft glue used by painters; gluey varnish used by gilders, paper-makers, and artists (see Glue: Gelatine): V. to cover with size, or prepare with it. Si'zing, imp.: N. a kind of glue used in manufactures, arts, etc. Sized, pp. *sīzd*. Si'ziness, n. *-zĭ-nĕs*, the quality of being gluey or viscous. Si'zy, a. *-zĭ*, thick and viscous; glutinous.

SIZEL, n. *sī'zĕl* [a corruption of Scissel, which see]: in *coining*, the residue of bars of silver after pieces are cut out for coins.

SIZZLE, v. *sĭz'l* [a frequent. of *siss*]: to dry or shrivel up with a hissing noise by the action of fire: N. a hissing noise.

SKADDON, n. *skăd'on* [etym. doubt.]: embryo of a bee.

SKAGEN, *skâ'ghėn*, Cape; or The Skaw: most northerly point of Jutland, Denmark. On it is a light-house of stone, 67 ft. high, lat. 57° 43′ 8″ n., long. 10° 36′ 5″ e.; and near it is a small town (pop. 1,400).

SKAGER-RACK, *skâ'ghėr-râk* ['Crooked Strait of Skagen;' *rack* is prob. from same root as AS. *raca*, Ger. *rachen*, throat; thus equivalent to Celtic *Kyle* (in Kyles of Bute), L. *gula*, English *gully*—is the *Race* of Alderney allied to *Rack?*]: arm of the North Sea (q.v.) between Denmark and Norway, and communicating with the Cattegat; about 150 m. long from w.s.w to e.n.e., and 80 m. broad. The depth is much greater on the Norwegian (about 200 fathoms) than on the Danish coast—being on the latter 30 to 40 fathoms, increasing toward the centre to about 60. When free from violent storms—to which it is subject—the current runs e. on the side next Denmark, and w. on the side next Norway, the harbors all being on the Norwegian coast.

SKAINSMATE, n. *skānz'māt* [Scot. *skean;* Ir. and Gael. *sgian,* a knife]: in *OE.*, a dagger-companion; a fellow cut-throat; a messmate or a companion in a disreputable sense.

SKALD—SKALDIC: see SCALD 2.

SKALITZ, *skâ'lĭts,* or SZAKOLCZA, *sâk-olts'â:* town in n.w. Hungary, near the borders of Moravia, 47 m.n. of Presburg, on the left bank of the March. It is nearly in the form of a square, surrounded by walls; has several Prot. and Rom. Cath. churches, a Franciscan monastery, town-hall, etc., besides large manufactures of cloth. Good wine is produced in the vicinity, and hemp is largely grown. Pop. (1880) 5,715.

SKATE, n. *skāt* [Dut. *schaatsen,* skates: Dan. *sköite;* Sw. *skid,* a skate]: frame of wood metal, etc., shaped for fitting on the sole of a boot or shoe, and furnished on its under side with a keel or ridge of steel (often called the blade), used for gliding rapidly on the surface of ice: V. to move on ice by means of skates. SKA'TING, imp.: N. the act or art of gliding or moving on ice by means of skates (see below). SKA'TED, pp. SKA'TER, n. *-tėr,* one who skates. ROLLER-SKATE, skate with small parallel wheels at toe and heel, so hung that the wheel-axles can move out of parallel according to the skater's motion—i.e., the wheels set squarely on the surface whether the skater be upright or canted: these skates are for use on floors of wood or asphalt; and were invented by James L. Plimpton, of New York, 1869. The exertion in their use is much greater than in ordinary skating. Many large inclosed rinks were built for this exercise a few years ago, in England and the United States.

SKATE, n. *skāt* [L. *squātus* or *squatĭna,* a species of shark: Icel. *skata,* a skate, from its pointed tail: Norw. *skata,* to run to a point: Ir. and Gael. *sgat,* a skate]: popular name of several species of Ray (q.v.).—The COMMON S. (*Raia batis*), known in Scotland as the *Blue S.* or *Gray S.*, and in s. England as the *Tinker,* is plentiful on most parts of the Brit. coasts; the breadth of the body is to its length in the proportion of about four to three; the snout sharp; a short hard tubercle in front of each eye, and another on the inner side of each; a single row of spines commencing on the dorsal ridge near the origin of the ventral fins, and reaching along the tail; upper parts grayish brown, belly dusky white with darker lines. It attains a large size, having been known to weigh 200 lbs. —The LONG-NOSED S. (*R. rostrata* or *mucronata*) is remarkable for elongation and sharpness of the snout. The upper surface is of light-lead color, the lower grayish white. The tail has a row of crooked spines: this species attains a large size.—The SHARP-NOSED S. (*R. oxyrhynchus*) also has a very sharp snout, but less elongated: it is thicker in proportion to its other dimensions than any of the other Brit. species, and attains a very great weight.—The FLAPPER S. (*R. intermedia*) is very thin and broad; the upper surface is dark olive-green with numerous white spots.—Skates are very voracious. They are often caught by lines and by trawl-nets; and are esteemed for food in most countries, yet on some parts of the Brit. coast they were until recently rejected as worthless.—For the N. Amer. species of S., see RAY.

SKATING: gliding, or moving rapidly, on ice, or other smooth surface. Skating had its origin probably in the far n. of Europe: in Sweden, Denmark, Holland, etc., it is a usual mode of winter travel: in other countries it is generally rather a means of amusement and physical exercise. The great depth of snow in the northern regions of America limits the opportunity for skating: there the SNOW-SHOE (q.v.) affords the surest means of locomotion in winter. As a pastime, skating is practiced in all civilized countries wherever the climate presents favorable conditions: and by the use of roller-skates (see SKATE) the exercise may be had without regard to season or climate. Originally certain bones of large animals were fashioned into skates: wood also was early used. The first improvement on wooden skates was the addition of a runner or keel of iron or steel. There are in modern skating two distinct styles, which require different kinds of skates and different extents and qualities of ice: these are the 'running' style, and the 'figure skating' style. In running, the one aim is speed. In the running skate the heel is at right angles with the ice; the prow projects 4 in., rising at a gradually increasing angle. Each foot is raised alternately and set down on the inside edge: immediately it takes a forward motion, which is increased by the push of the other foot. The fastest times on record are as follows: 200 yds. 19¾ sec.; 880 yds 1 min. 24⅘ sec.; 1 mile 3 min. 28⅕ sec.; 1½ miles 4 min. 46 sec.; 3 miles 9 min. 17 sec.; 10 miles 47 min. 45 sec.; 20 miles 1 hour 8 min. 15 sec.; 50 miles 4 hours 13 min. 36 sec.; 100 miles 11 hours 37 min. 45 sec.; 400 miles 138 hours 35 min.—In skates for 'figure skating' the blade projects but a very little beyond the foot, and it is rounded both at toe and heel. Figure skating is practiced frequently in 'rinks' in which shallow artificial ponds are frozen overnight and protected from snow by a roof. Figure skating consists—besides the graceful and stately 'roll'—in cutting arcs, circles, figures, letters, serpentines, and spirals, either forward or backward, slowly or rapidly, on one or both feet, singly or in combination. In this style of skating, the outer edge of the keel or blade is much in use. The standard figures are the '8', 'grapevine,' 'on to Richmond,' 'double shamrock,' different 'stars,' etc.

SKEAN, n. *skēn* [Gael. *sgian*, a knife]: in *Scot.*, a dirk or dagger; a knife. SKEAN-DHU, n. *skē'ăn-dū* [Gael. *sgian-dubh*, a black knife, a dagger—from SGIAN, *skĕ-ăn'*, a knife; *dubh*, black]: in *Scot.*, a short dagger; a dirk; a knife which serves either for stabbing or carving.

SKEAT, *skēt*, WALTER WILLIAM: clergyman of the Church of England, and author: b. London, England, 1835, Nov. 21. He graduated from Christ's College, Cambridge, 1858; two years later became a fellow of this college and was appointed curate of East Dereham; became curate of Godalming 1862; lecturer at Christ's College 1864; prof. of Anglo-Saxon at Cambridge 1878; and was again elected fellow of Christ's College 1883 He has made a special study of Eng. etymology and early English literature and has edited for the Early English Text Soc. a number of works, including *Piers the Plowman's Crede* and *The Lay of Havelok the Dane*. He completed an ed. of the Anglo-Saxon Gospels left unfinished at the death of its projector, J. M. Kemble; was one of the founders of the Eng. Dialect Soc., for which he has edited several books; has also edited the *King's Quair* for the Scottish Text Soc., various works for the Oxford Press, and a five-volume ed. of the works of Chaucer, which he prepared 1890–1 for the Clarendon Press. His most important work is an *Etymological English Dictionary*, which ranks among authorities in its specialty.

SKEDADDLE, v. *skĕ-dăd'l* [probably connected with Dut. *schudden*, to shake, to jolt: OE. *scuddle*, to run away all of a sudden]: an Americanism—to act the coward in running away from the post of danger or duty; to betake one's self to flight in a hasty or secret manner; to flee. SKEDAD'DLING, imp. *-lĭng*. SKEDAD'DLED, pp. *-dăd'ld.*

SKEET, n. *skēt* [comp. Ger. *schütten*, to send forth, to pour]: in *ships*, a scoop with a long handle, used to wet the decks and sides of a ship to keep them cool and prevent the splitting of the wood by the heat of the sun.

SKEG, n. *skĕg* [Icel. *skegg*, a beard, the beak or cut-water of a ship]: in *naut.*, a knee which unites and braces the stern-post and keel of a boat: a kind of oats. SKEG-SHORE, n. in *ship-build.*, one of several pieces of plank put up endways under the skeg of a heavy ship, to steady her after-part a little at the moment of launching.

SKEIN, n. *skān* [OF. *escaigne;* Ir. *sgainne*, a skein of thread: Gael. *sgeinnidh*, flax or hemp, thread]: a quantity of thread or silk yarn coiled together after being taken off the reel—the *skein* containing 80 threads, each 54 inches long.

SKELETON, n. *skĕl'ĕ-tŏn* [Gr. *skelĕtŏn*, a dried body, a mummy—from *skellō*, I make dry: F. *squelette*]: the bones of any animal dried and retained in their natural positions; the bones of an animal separate from its flesh (see below): outline or framework of anything; the heads or outline of a sermon or literary work: a person much emaciated: ADJ. consisting of mere framework; containing mere outlines or heads. SKEL'ETONIZE, v. *-tŏn-īz*, to reduce to the state of a skeleton. SKEL'ETONIZING, imp. SKEL'ETONIZED, pp. *-īzd*. SKELETOLOGY, n. *skĕl-ĕ-tŏl'o-jĭ*, in *med.*, branch of anatomy which treats of the skeleton. SKELETON-KEY, a thin light key with nearly the whole centre parts filed away. SKELETON IN THE CUPBOARD, any unpleasant personal or family secret.

SKEL'ETON: term denoting, in its largest sense, 'a more or less firm and complete *external* protection to a living body, also a more or less firm and complete *internal* support to such body' (*St. George Mivart*). External protection is afforded by the *Exoskeleton*, internal support by the *Endoskeleton*. In the invertebrate animals, the S., except in the case of certain corals, is tegumentary or dermal, forming the outer hard and protective covering, as in the *Echinodermata*, *Mollusca*, and *Crustacea;* and, like the epidermis and its appendages, is non-vascular, and can be increased only by additions to its edges. This hard insensible covering serves to protect the animal from hurtful external influences, and to afford fixed points of attachment to the muscles which move the body and limbs; the muscles, however, always lying interior to the S., and not clothing it, as we see in the Vertebrata. We scarcely ever observe, among the Invertebrata, that the S. bears any definite relation to the nervous system, which is merely protected by it to the same extent as the other soft tissues. Moreover, in none of these animals are the hard parts composed of true bone. The S. as it exists in vertebrated animals will be considered here.

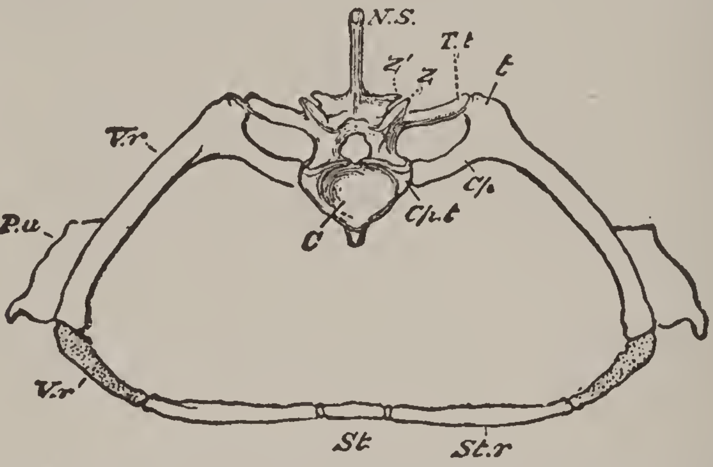
The external skeleton or *Exoskeleton* is formed from the two layers of the integument—the *epidermis*, a superficial, non-vascular substance, composed of cells constantly growing and multiplying in the deeper, and being thrown off in the superficial, layers; and the *dermis* or true skin, composed of more or less completely formed connective tissue: an exoskeleton may be formed by the hardening of either of these layers, The development of each is described substantially as follows by Prof. Huxley:

The *Epidermal Exoskeleton* results from conversion into horny matter (cornification) of the superficial cells of the epidermis. The horny plates thus formed are molded upon, and follow the configuration of the dermis, with its processes. When the latter are overlapping folds, the horny epidermic investment is called a *scale.* When the dermic process is papilliform and sunk in a pit of the dermis, the conical cap of modified epidermis which coats it is either a *hair* or a *feather:* to become a hair, the horny cone simply elongates by continual addition of new cells to its base; but in a feather the horny cone, which also elongates by addition to its base, splits up for a greater or less distance along the middle line of its under surface, and then spreads out into a flat vane, subdivided into *barbs*, *barbules*, etc. The epidermis remains soft and delicate in fishes and *Amphibia*. In *Reptilia* it sometimes takes the form of plates, which attain great size in many *Chelonia* (tortoises and turtles); sometimes that of overlapping scales in snakes and many lizards; but sometimes it remains soft, as in chameleons and many *Chelonia*. Epidermic plates in the form of *nails* appear on the terminal phalanges of the limbs. All *Aves* possess feathers; and in them, as in some *Reptilia*, the beak is partly or totally ensheathed in horn. Cornified epidermal tubercles or plates are developed on the tarsi and toes, the terminal phalanges of which have nails; and some birds have spurs, ensheathed in horn, on the legs or on the wings. In *Mammalia* the horny exoskeleton may assume all the forms above mentioned, except that of feathers. In some *Cetacea* it is almost absent, being reduced to a few hairs, present only in the fetal state. On the other hand, the pangolin (*Manis*) is almost completely covered with scales, the armadillos with plates, and most terrestrial mammals with a thick coat of hair. The greater part of the mass of the horns in oxen, sheep, and antelopes is due to the epidermic sheath that covers the bony core. Where the horny epidermis becomes very thick, as in the hoof of the horse and in the horn of the rhinoceros, numerous long papillæ of the dermis extend into it. These papillæ, however, are comparable to the ridges of the bed of the nail, not to the papillæ of the hairs.

The *Dermal Exoskeleton* arises from the hardening of the dermis; in the majority of cases by the deposit of bone-earth in more or loss completely formed connective tissue, though the resulting hard tissue has by no means always the structure of bone. It may happen that cartilage is developed in the dermis, and, either in its primary state or ossified, gives place to exoskeletal parts. No dermal exoskeleton (except that of the fin-rays) exists in the lowest fishes, *Amphioxus* and the *Marsipobranchii*. In most *Teleostei* the integument is raised up into overlapping folds, and in these calcification takes place in laminæ, of which the oldest is the most superficial and lies immediately beneath the epidermis. As a general rule, the calcified tissue of the 'scale' thus formed does not possess in the *Teleostei* the structure of true bone. But in other fishes the dermal calcification may consist of true bone (as in the sturgeon); or, as in the rays and sharks, may take on the structure of teeth, and consist of a matter comparable to dentine.—A form of dermal exoskeleton characteristic of fishes is seen in the fin-rays. These are developed in the integument either of the median line of the body or in that of the limbs. In the former case they usually enter into, or support, folds of the integument usually termed *dorsal*, *caudal*, or *anal* fins. Ordinary fin-rays are composed of a horn-like or more or less calcified substance. The *Amphibia* generally are devoid of dermal exoskeleton, but some of them (*Cœciliæ*) have scales like those of fishes. The *Ophidia* have no dermal exoskeleton. Many lizards have bony dermal plates in size and form corresponding to the epidermal scales. All *Crocodilia* have bony plates in the dorsal region of the body and tail; in some they are developed in the ventral region. In the *Mammalia* the development of a dermal exoskeleton is very rare, occurring only in the loricated *Edentata*.

The *Endoskeleton* consists of connective tissue, to which cartilage and bone may be added in various proportions; together with the tissue of the notochord, which cannot be classed under either of these heads. The endoskeleton is distinguishable into two independent portions—the one *axial*, or belonging to the head and trunk; the other *appendicular*, to the limbs. The *axial* endoskeleton usually consists of two systems of skeletal parts, the *spinal* system and the *cranial* system. For the development of the cranial system, see SKULL. The development of the spinal system in the higher *Vertebrata* is as follows: The first essential differentiation between the skull and the vertebral column is effected in the appearance of the *protovertebræ.* At regular intervals, commencing at the anterior part of the cervical region, and gradually extending backward, the indifferent tissue on each side of the notochord undergoes a histological change, and gives rise to more opaque, quadrate masses, on opposite sides of the notochord: each pair of those gradually unite above and below that structure, and send arched prolongations into the walls of the spinal canal, so as to constitute a protovertebra. The protovertebræ consist at first of mere indifferent tissue; and it is by a process of histological differentiation within the protovertebral masses that from its deeper parts one of the *spinal ganglia* and a *cartilaginous vertebral centrum*, and from its superficial layer a *segment of the dorsal muscles,* are produced. Chondrification (process of turning into cartilage) extends upward into the walls of the dorsal tube, to produce the *neural arch* and *spine* of each vertebra; and outward into the wall of the thoracic and abdominal part of the ventral tube, to give rise to the *transverse processes* and *ribs.* In fishes the latter remain distinct and separate at their distal ends; but in most reptiles, in birds, and in mammals the ends of some of the anterior ribs on both sides unite, and then the united parts coalesce in the middle line to form a median subthoracic cartilage—the *sternum.* When Ossification (q.v.) sets in, the centra (or bodies) of the vertebræ are usually ossified, in great measure, from ring-like deposits that closely invest the notochord; the arches from two lateral deposits which may extend more or less into the centrum. The vertebral and the sternal portions of a rib may each have a separate centre of ossification, and become distinct bones; or the sternal parts may remain always cartilaginous. The sternum itself is variously ossified. Between the completely ossified condition of the vertebral column and its earliest state are many gradations, most of which are more or less completely realized in the adult conditions of certain vertebrated animals. The vertebral column may be represented by nothing but a notochord with a structureless, or more or less fibrous, or cartilaginous sheath, with or without rudiments of cartilaginous arches and ribs. Or there may be bony rings or ensheathing ossifications in its walls; or it may have ossified neural arches and ribs only, without cartilaginous or osseous centra. The vertebræ may be completely ossified, with very deeply biconcave bodies (centra), the notochord persisting in the doubly conical intervertebral substance; or ossification may extend so as to render the centrum concave on one surface and convex on the other, or even convex on both ends. A vertebra is *amphicœlous* [Gr. *amphi*, at both ends; *koilos*, hollow] when its centrum is concave at both ends; when it has a concavity forward and a convexity hindward, it is *procœlous* [Gr. *pro*, forward]; where this latter position of concavity and convexity is reversed, the vertebra is *opisthocœlous* [Gr. *opisthe*, behind]. In *Mammalia* the centra are usually flat at each end, the terminal faces being discoidal *epiphyses* developed from centres of ossification distinct from that of the centrum itself. The centra may be united to each other by synovial joints or by ligamentous fibres—the *intervertebral ligaments*. The arches are connected by ligaments, generally also by overlapping articular processes called *zygapophyses* or oblique processes [Gr. *zugon*, that which joins two bodies; *apophusis*, process]. In very many mammals the first and second cervical vertebræ—the *atlas* and the *axis*—undergo a singular change: the central ossification of the body of the atlas does not coalesce with its lateral and inferior ossifications, but either persists as a distinct *os odontoideum* [L. *os*, bone; Gr. *odontoides*, tooth-like], or anchyloses with the body of the axis, and becomes the *odontoid process* of this vertebra. In vertebrates with well-developed hind-limbs, one or more vertebræ at the posterior part of the trunk usually become peculiarily modified, and give rise to a *sacrum*, with which the pelvic arch is connected by the intermediation of expanded and anchylosed ribs. The verterbæ in front of the sacrum are known as *cervical*, *dorsal*, and *lumbar*. The first vertebra that has ribs connected with the sternum is *dorsal*, as are all those behind it that have distinct ribs. Vertebræ without distinct ribs, between the last dorsal and the sacrum, are *lumbar*. Vertebræ with or without ribs, in front of the first dorsal, are *cervical*. The vertebræ posterior to the sacrum are *caudal* or coccygeal: very frequently, downward processes of these vertebræ inclose the backward continuation of the aorta, and may be separately ossified as *subcaudal*, or chevron, bones. A tolerably complete segment of the spinal skeleton is seen in the anterior part of the thorax of a crocodile. It presents a procœlous vertebral centrum (*C.*); united with which by the *neurocentral suture* is the *neural arch*, which rises into the *neural spine* (*N.S.*). Two processes, the *prezygapophyses* (*Z*), extend from the front part of the arch, and have flat articular surfaces turned dorsally. Two others of similar form, but having their articular surfaces turned ventrally, proceed from the posterior face of the neural arch, and are the *postzygapophyses* (**Z**).

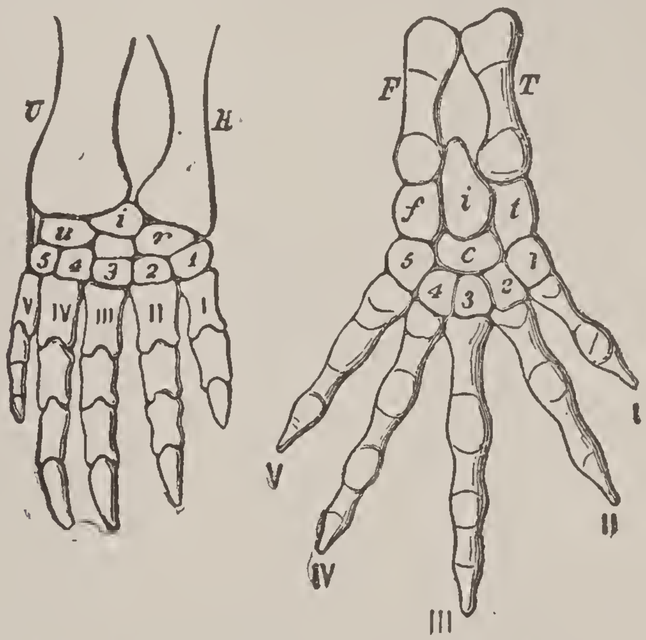
By these, which are often called oblique, or articular, processes, the vertebra articulates with the corresponding processes of its predecessor or successor in the series. The *transverse processes* are two on each side, one superior and one inferior. The former (*T.t*) articulates with the *tuberculum* of the rib, the latter (*Cp.t*) with its *capitulum*. They may therefore be called *capitular* and *tubercular transverse processes* respectively. Each rib is divided by an articulation into a vertebral (*V.r*) and a sternal (*St.r*) part. The former remains unossified for a considerable distance at its distal end (*V.r′*); the latter is more or less converted into cartilage bone. The proximal end of the vertebral rib bifurcates into a *tuberculum* (*t*) and a *capitulum* (*Cp*). The distal end of the sternal rib unites with the more or less ossified but unsegmented cartilage, which forms the sternum (*St*). A cartilaginous, or partly ossified, *uncinate process* (*P.u*) projects from the posterior edge of the vertebral rib, over the intercostal space. In the majority of the *Vertebrata*, the caudal vertebræ gradually diminish in size toward the extremity of the body, and become reduced, by the non-development of osseous processes or arches, to mere centra. But in many fishes which possess well-ossified trunk-vertebræ, no distinct centra are developed at the extremity of the caudal region, and the notochord, invested in a more or less thickened, fibrous, or cartilaginous sheath, persists.



Segment of the endoskeleton in the anterior thoracic region of the body of a crocodile:

C, centrum or body of the vertebra; *N.S.*, neural spine; *Z*, prezygapophysis; *Z′*, postzygapophysis; *T.t*, transverse process which articulates with the tuberculum of the rib (*t*); *Cp.t*, that which articulates with the capitulum of the rib (*Cp*); *V.r*, ossified vertebral rib; *V.r′*, the part of the vertebral rib that remains cartilaginous; *St.r*, sternal rib; *St*, artificially separated segment of the sternum; *P.u*, uncinate process.

Appendicular Endoskeleton.—In all vertebrated animals the limbs first appear as buds on each side of the body: in all except fishes, these buds become divided by constrictions into three segments, of which the proximal is called *brachium* in the fore-limbs, *femur* in the hind; the middle is called *antebrachium*, or *crus*; the distal, *manus*, or *pes*. The proximal division normally contains one bone only, *os humeri* (or simply *humerus*) in the *brachium*, and *os femoris* (or *femur*) in the thigh; the middle has two bones side by side, *radius* and *ulna*, and *tibia* and *fibula;* the distal division has many bones, so disposed as to form not more than five longitudinal series except in the *Ichthyosauria*, where marginal bones are added, and some of the digits bifurcate. The skeletal elements of the manus and pes (*hand* and *foot*) are divisible into a proximal set, constituting the *carpus*, or *tarsus*, and a distal set, the *digits*, of which there are normally five, articulated with the distal bones of the carpus and tarsus. Each digit has a proximal *basi-digital* (*metacarpal* or *metatarsal*) bone, upon which follows a linear series of *phalanges*. It is convenient always to count the digits in the same way, commencing from the radial or tibial side: thus, in Man the thumb (pollex) is the first digit of the hand, and the great toe (hallex) the first digit of the foot. When least modified, the carpus and tarsus seem composed of skeletal parts alike in number and in arrangement. One of these, primitively situated in the centre of the carpus or tarsus, is termed the *centrale;* on the distal side of this are five *carpalia* or *tarsalia*, which articulate with the several metacarpal or metatarsal bones; on its proximal side are three bones—one *radiale* or *tibiale*, articulating with the radius or tibia; one *ulnare* or *fibulare*, with the ulna or fibula; and one *intermedium*, between the foregoing. Carpal and tarsal bones, or cartilages, thus disposed are seen in some *Amphibia* and *Chelonia* (see fig.), but commonly the typical arrangement is disturbed by suppression of some of these elements, or their mutual coalescence. Thus, in the carpus of Man, the radiale, intermedium, and ulnare are represented by the *scaphoides*, *lunare*, and *cuneiforme* respectively. The centrale is not



Right fore-foot of the Chelonian *Chelydra*, and right hind-foot of the Amphibian *Salamandra:*

U, ulna; *R*. radius; *F*, fibula; *T*, tibia. Proximal carpal bones: *r*, radiale; *i*, intermedium; *u*, ulnare; the middle unlettered bone is the centrale. Proximal tarsal bones: *t*, tibiale, *i*, intermedium; *f*, fibulare; 1, 2, 3, 4, 5, distal carpalia and tarsalia; I., II., III., IV.,V. digits.

represented in a distinct shape, having probably coalesced with the other elements of the carpus. The fourth and fifth carpalia have coalesced, and form the single *unciforme.*

Position of the Limbs.—In their primitive position, the limbs are straight, directed outward, at right angles to the axis of the body; but as development proceeds, they become bent in such a manner that, first, the middle division of each limb is flexed downward and toward the middle line, upon the proximal division; while the distal division takes an opposite bend on the middle division. In many *Amphibia* and *Reptilia* the limbs of the adult do not greatly depart from this primitive position; but in birds and in mammals further changes occur. Thus, in all ordinary quadrupeds the brachium is turned backward and the thigh forward, so that both elbow and knee lie close to the sides of the body. Then, too, the fore-arm is flexed on the arm, and the leg on the thigh. In Man a still greater change occurs. In the natural erect posture the axes of both arm and leg are parallel with the axis of the body, instead of perpendicular to it. The proper ventral surface of the brachium looks forward, and that of the thigh backward, while the dorsal surface of the latter looks forward. The dorsal surface of the antebrachium looks outward and backward, that of the leg directly forward. The dorsal surface of the manus is external, that of the pes superior. Thus, speaking broadly, the back of the arm corresponds with the front of the leg, and the outer side of the leg with the inner side of the arm, in the erect position. Among terrestrial mammals the most striking changes of the manus and pes arise from the gradual reduction in number of the perfect digits from the normal number (5) to 4 (in *Sus*), 3 (in *Rhinoceros*), 2 (in most *Ruminantia*), and 1 (in *Equidæ*).

Pectoral and Pelvic Arches.—The proximal skeletal elements of each pair of limbs (*humeri* or *femora*) are supported by a primitively cartilaginous *pectoral* or *pelvic* girdle, which lies external to the costal elements of the vertebral skeleton. This girdle may consist of a simple cartilaginous arc (as in Sharks and Rays), or it may be complicated by subdivisions and additions. The pectoral arch may be connected with the skull or with the vertebral column by muscles, ligaments, or dermal ossifications, though primitively it is perfectly free from both; but it is never united with the vertebræ by the intermediation of ribs. The pelvic, like the pectoral arch, at first consists of a simple continuous cartilage on each side, which, in *Vertebrata* higher than fishes, is divided by the *acetabulum,* or articular cavity for the reception of the head of the femur, into a dorsal and a ventral cavity. Three separate ossifications usually take place in this cartilage—one in the dorsal and two in the ventral half. Hence the pelvic arch eventually consists of a dorsal portion, called *ilium,* and of two ventral elements, the *pubis* anteriorly, and the *ischium* posteriorly. In Fishes the limbs have an endoskeleton which only imperfectly corresponds with that of the higher *Vertebrata;* for while homologues of the cartilaginous, and

SKELETON.

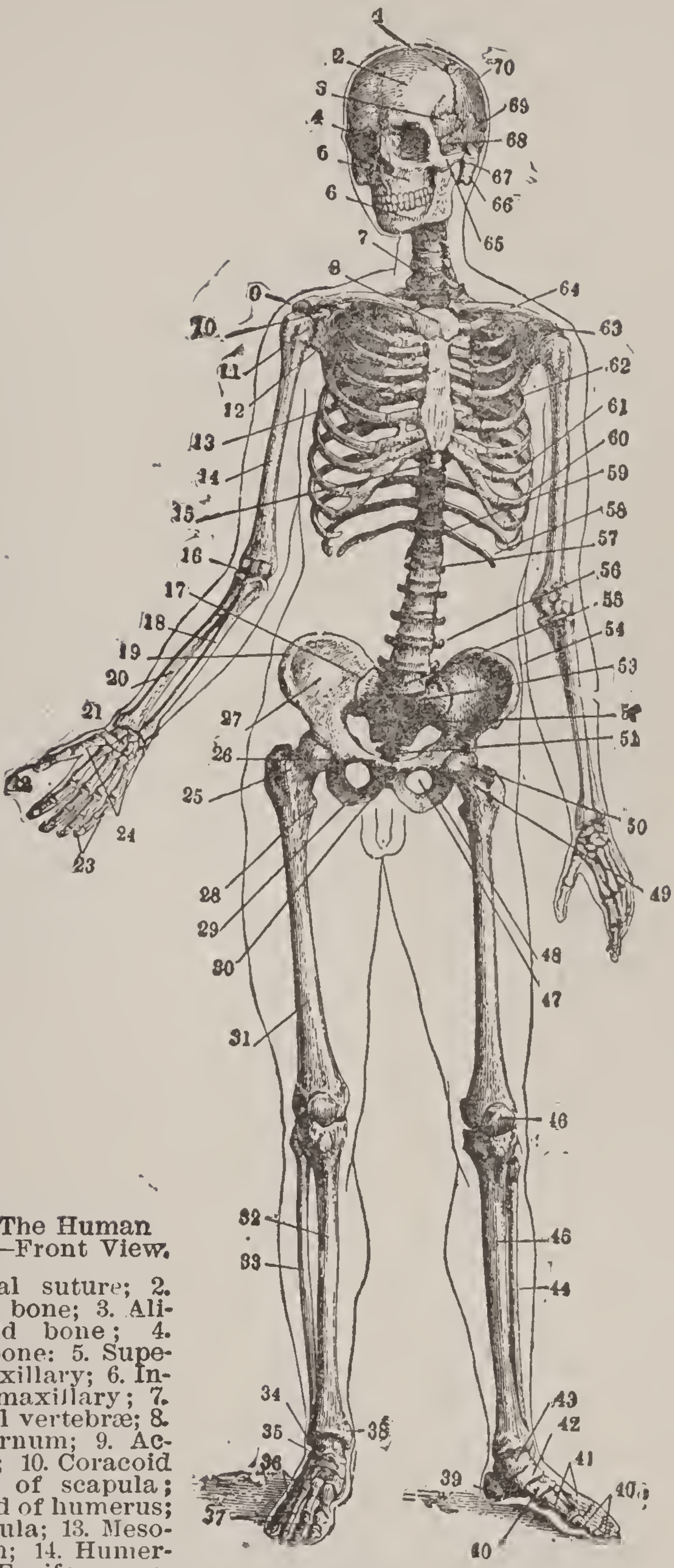


Fig. 1.—The Human Skeleton—Front View.

1. Coronal suture; 2. Frontal bone; 3. Alisphenoid bone; 4. Nasal bone: 5. Superior maxillary; 6. Inferior maxillary; 7. Cervical vertebræ; 8. Præ-sternum; 9. Acromion; 10. Coracoid process of scapula; 11. Head of humerus; 12. Scapula; 13. Meso-sternum; 14. Humerus; 15. Ensiform process of sternum; 16. Elbow-joint; 17. Ilio-sacral articulation; 18. Ulna; 19. Crest of ilium; 20. Radius; 21. Carpus; 22. Pollex; 23. Phalanges; 24. Metacarpals; 25. External trochanter; 26. Os pubis; 27. Ilium; 28. Internal trochanter; 29. Tuberosity of ischium; 30. Pubic symphysis; 31. Femur; 32. Tibia; 33. Fibula; 34. Internal malleolus; 35. Tarsus; 36. Metatarsals; 37. Phalanges; 38. Internal malleolus; 39. Os calcis; 40. First cuneiform bone; 40a. Phalanges; 41. Metatarsals; 42. Scaphoid; 43. Astragalus; 44. Fibula; 45. Tibia; 46. Patella; 47. Obturator foramen; 48. Ischium; 49. Neck of femur; 50. Head of femur; 51. Coccyx; 52. Sacrum; 53. Base of sacrum; 54. Crest of ilium; 55. 5th lumbar vertebra; 56. Transverse process; 57. 1st lumbar vertebra; 58. 12th (5th false) rib; 59. 12th thoracic vertebra; 60. 8th (1st false) rib; 61. 7th rib; 62. Costal cartilage: 63. 1st rib; 64. Clavicle; 65. Zygoma; 66. Mastoid process; 67. Temporo-maxillary joint; 68. Glenoid fossa; 69. Squamoso-temporal; 70. Parietal.

SKELETON.

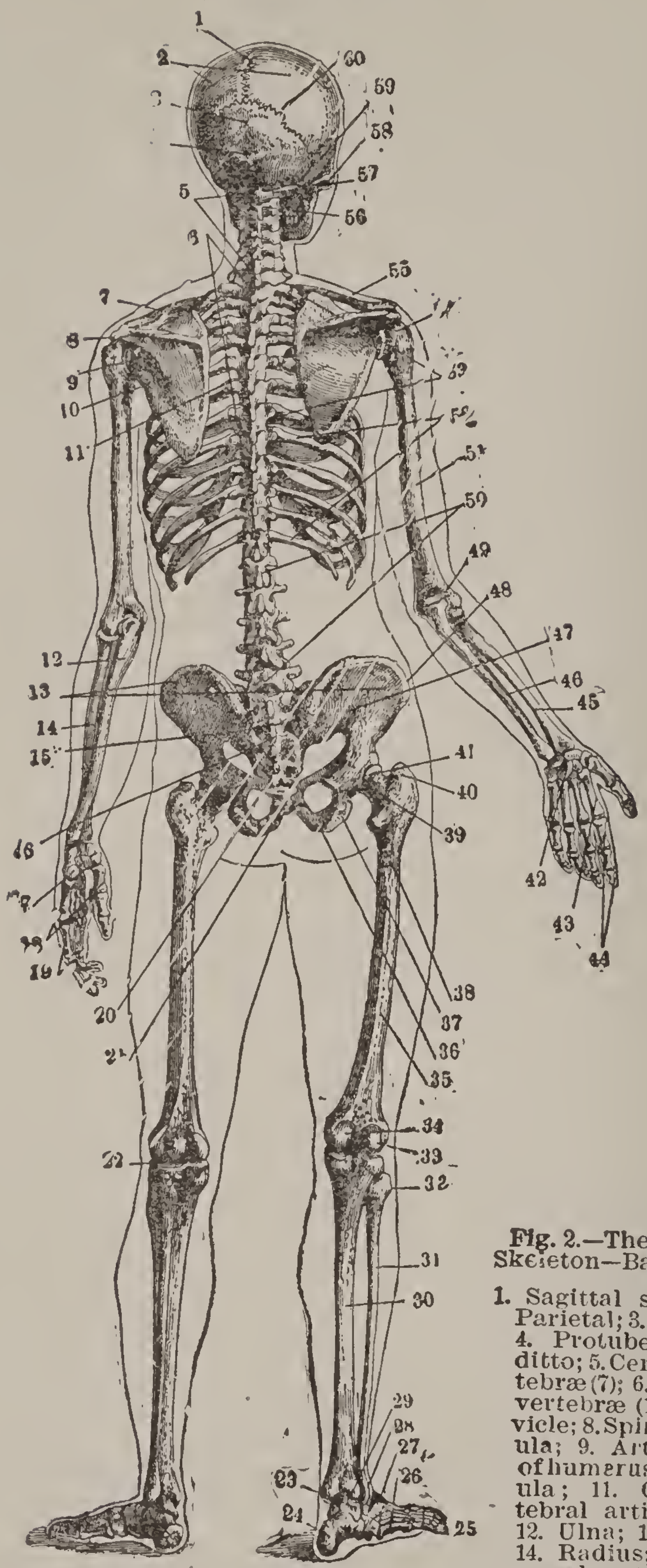


Fig. 2.—The Human Skeleton—Back View.

1. Sagittal suture; 2. Parietal; 3. Occipital; 4. Protuberance of ditto; 5. Cervical vertebræ (7); 6. Thoracic vertebræ (12); 7. Clavicle; 8. Spine of scapula; 9. Articulation of humerus; 10. Scapula; 11. Costo-vertebral articulation; 12. Ulna; 13. Pelvis; 14. Radius; 15. Ilio-sacral articulation; 16. Sacrum; 17. Carpals; 18. Metacarpals; 19. Phalanges; 20. Obturator-foramen; 21. Coccyx; 22. Knee-joint; 23. Internal malleolus; 24. Os calcis; 25. Phalanges; 26. Metatarsals; 27. Tarsus; 28. External malleolus; 29. Astragalus; 30. Tibia; 31. Fibula; 32. Head of Fibula; 33. External condyle; 34. Internal condyle; 35. Femur; 36. Tuberosity of ischium. 37. Ischium; 38. Internal trochanter; 39. Neck of femur; 40. External trochanter; 41. Articulation of femur; 42. Carpus; 43. Metacarpus; 44. Phalanges; 45. Radius; 46. Ulna; 47. Ilium; 48. Crest of ilium; 49. Olecranon; 50. Lumbar vertebræ; 51. Humerus; 52. False ribs (8th—12th), 53. Ribs—true (1st—7th); 54. Head of humerus; 55. Clavicle; 56. Atlas; 57. Axis; 58. Zygoma; 59. Squamous portion temporal bone; 60. Lamboidal suture.

even of the bony, constituents of the pectoral and pelvic arches of the latter are traceable in Fishes, the cartilaginous, or ossified, basal and radial supports of the fins themselves cannot be identified, unless in the most general way, with the limb-bones, or cartilages, of the other *Vertebrata*.

The number of separate bones in the *Human Skeleton* is usually reckoned as 206—the 32 teeth not being included. For the physical and chemical constitution of the parts of the S., see BONE: CARTILAGE: OSSIFICATION. The bones of the human S. are divided by anatomists into three classes—long, flat, and irregular. The long bones constitute the S. of the extremities, and consist of a shaft of hard dense tissue, usually hollow and filled with marrow. The flat bones and the irregular bones usually inclose cavities —as the brain-case, the chest, the abdomen. They consist of two layers of dense tissue, with a spongy tissue between. The bones are classed also with regard to the region of the S. occupied by them. Thus, the SKULL (q.v.) has 22 bones, of which 8 belong to the cranium (cranial bones) and 14 to the face (facial bones). In the trunk are 54 bones, of which 50 belong to the neck, thorax, and abdomen, and 4 to the PELVIS (q.v.). The bones of the upper extremities (arms) number 64, and those of the lower extremities (legs) 60. Also there are the ossicles of the tympanum, 6: see EAR. The accompanying plates exhibit all these in their places in the skeleton or separately. For a detailed account of each, see the several titles, e.g., CLAVICLE: FOOT: HAND: HYOID BONE: LEG: SCAPULA: SPINAL COLUMN: ETC.

SKELLIGS, *skĕl′lĭgz*, THE: three rocky islands on the w. coast of Ireland, about 8 m. w. of Bolus Head, county Kerry; long. 10° 32′ w. The lights on the Great Skellig are the first visible to ships crossing the Atlantic.

SKELLUM, n. *skĕl′ŭm* [Dan. *skielm*, a rogue: Dut. and Ger. *schelm*, a rogue]: in *Scot.* and *OE.*, a rogue; a villain; a scoundrel.

SKELP, n. *skĕlp* [etym. doubt.]: a strip of iron which is bent and welded into a tube to form a gun-barrel or pipe.

SKELTON, *skĕl′ton*, JOHN: early English satirical poet: prob. about 1460–1529; b. in Norfolk or in Cumberland. He studied at Cambridge and Oxford, and received from each the academical honor of laureate. His sovereign, Henry VII., appointed him tutor to Prince Henry, afterward King Henry VIII.; and Erasmus styled him the light and grace of British scholars. He became a priest 1498, and was rector of Diss in Norfolk, shortly after which he seems to have struck into his unique vein of original vernacular poetry addressed to the multitude, which has given him his place as one of the most eccentric writers in literature. It consists in a flow of rattling voluble verse, unrestrained satire and jocularity, and a profusion of grotesque imagery mixed with Latin and slang phrases. He often indulges in ribaldry and buffoonery. At times he has gleams of bright fancy and snatches of pleasant description. Of this higher class is his *Philip Sparrow*, a poetical lamentation by a young maiden (whose charms the poet describes with great gusto and minuteness) over the loss of a pet bird slain in a convent of black nuns. The most humorous of his pictures of low life—often coarse—are in *The Tunning* [or Brewing] *of Elynor Rummyng*, an alewife at Leatherhead in Surrey. This poem was highly popular, and was often reprinted in black-letter, garnished with a rude wood-cut representation of the fat hostess. His best satires are *Colin Clout* and *Why come ye not to Court?* The former is a general satire on the clergy; and the latter a merciless and virulent attack on Cardinal Wolsey, whom the unscrupulous poet had previously flattered, but who had disappointed him of a prebend which he coveted. In this scurrilous lampoon, Wolsey is not only charged with arrogance, avariciousness, and incontinence, but is reminded of his 'base original' and 'greasy genealogy,' having been 'cast out of a butcher's stall.' The enraged cardinal ordered his libeller to be arrested; but S. took refuge in the sanctuary at Westminster, and received the protection of Abbot Islip. From this retreat he did not dare to emerge, and remained silent till his death. The 'pithy, pleasaunt, and profitable workes of Maister Skelton, Poete Laureate,' were collected and published 1568, reprinted 1736. A careful ed., by the Rev. A. Dyce, was issued 1843, 2 vols. 8vo.

SKEP, n. *skĕp*, or Skip, n. *skĭp* [Gael. *sgeap*, a bee-hive AS. *scep*, a basket]: wooden or wicker-work vessel, wide at top, coarse basket: a definite measure of capacity: in *manufacture*, leather basket for carrying bobbins of yarn in a spinning-mill: bee-hive: in *mining* iron box running between guides, for raising ore—in this sense written *skip*.

SKEPTIC, or Sceptic, n. *skĕp'tĭk* [F. *sceptique*, a skeptic—from mid. L. *scepticus*—from Gr. *skeptikos*, thoughtful, reflective, pertaining to those who took nothing for granted—from Gr. *skep'tomai*, I consider]: *primarily*, one who thinks for himself and accepts nothing on the testimony of others; one who doubts or denies the existence of God, of a revelation, or the truth of any system of principles or doctrines. Skep'tic, a. *-tĭk*, or Skep'tical, a. *-tĭ-kăl*, doubting, or hesitating to admit, the certainty of doctrines or principles; unbelieving. Skep'tically, ad. *-lĭ*. Skep'ticalness, n. *-nĕs*, the state of being skeptical. Skep'ticism, n. *-sĭzm*, universal doubt; unbelief in any particular doctrine or system (see below).—Syn. of 'skeptic, n.': unbeliever; doubter; agnostic; infidel; freethinker.

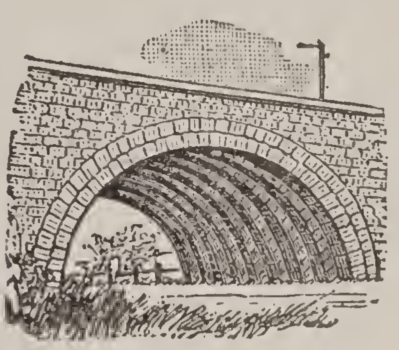
SKEP'TICISM, or Scep'ticism: strictly, that condition of the mind before it has arrived at conclusive opinions—while still reflecting, examining, or pondering over subjects of thought. S. is therefore the opposite of dogmatism (see Dogma). The notion of 'disbelief' is quite a secondary, though now very common, meaning of the term. Among the Greeks a *skeptikos*, 'skeptic,' was originally only a thoughtful person, and the verb *skeptomai* never acquired any other signification than 'to consider.' But inasmuch as the mass of men rush to conclusions with haste, and assert them with far more positiveness than their knowledge warrants, the discerning few of clearer vision or cooler head are often brought into collision with popular beliefs—especially in religion, the sphere in which popular beliefs are most numerous, most positive, and most inconsiderate; and are compelled by the violent shock given to their reason to 'doubt,' it may be to 'disbelieve' (not necessarily to 'deny'), what they hear affirmed by the multitude with indefensible emphasis of speech. Thus in common parlance a skeptic has come to mean an infidel, and S. infidelity. But the field of thought in which S. properly so called has preferred to exercise itself is not religion, but philosophy. Philosophical skeptics in all ages and countries have generally denied or at least doubted the trustworthiness of the senses as vehicles of absolute truth, and so have destroyed the very possibility of speculation. In ancient times, Pyrrhon (q.v.), in modern, David Hume (q.v.), are the most characteristic representatives of this kind of skepticism. In general reference, see also Gorgias: Heraclitus of Ephesus: Carneades: Sextus Empiricus: Kant, Immanuel.

SKERRY, n. *skĕr'rĭ*, Sker'ries, n. plu. *-rĭz* [Icel. *sker*, a rock: Ger. *schere*, a rock, a cliff: Gael. *sgeir*, a rock in the sea]: rocky isle; a reef. The Skerries, small islands about 2 m. off the n.w. coast of Anglesey, Wales; having a light-house 117 ft. high. See also Pentland Firth.

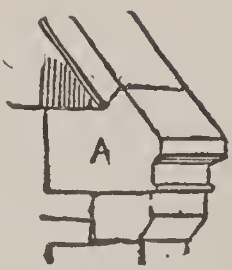
SKERRYVORE, *skĕr-rĭ-vōr':* chief rock of a reef about 10 m. s.s.w. of the s.w. point of the island of Tiree (q.v.), 24 m. w. of Iona. This reef, which stretches 8 to 10 m. w.s.w., is composed of compact gneiss, worn smooth by constant action of the waves; and was long a terror to mariners, having caused the loss of one ship annually for 40 years previous to 1844. The difficulty of landing on the rock, from the immense force (three tons to the superficial ft.) with which the Atlantic waves beat upon it, delayed the building of a light-house till 1834, when designs and preparations were made by Alan Stevenson, who began operations on the rock 1838, following generally the mode adopted by his father, Robert Stevenson (q.v.), in constructing the Bell Rock (q.v.) Light-house. The work was finished 1844. The light-house is 138½ ft. high; at the base 42 ft., at the top 16 ft., in diameter. The revolving light is visible 18 m. The cost was nearly £87,000. S. Light-house is nearly two-fifths higher than that on Bell Rock, and more than twice as high as the Eddystone. A small group of rocks belonging to this reef, and three m. w. of the light-house, is known as Stevenson's Rocks.

SKETCH, n. *skĕch* [Dut. *schets*, a sketch—from It. *schizzo*, an outline or sketch—from L. *schedĭus;* Gr. *schedĭŏs*, made hastily]: a rough dash or outline; the rough or first draught of any plan or design; a slightly executed picture, in which the general effect is attended to, but not the details: V. to draw the outline or general figure of; to make a rough draught of; to plan; to delineate. Sketch'ing, imp.: N. the art of copying from nature for a finished work; the art or practice of copying in outline. Sketched, pp. *skĕcht*. Sketch'er, n. *-ĕr*, one who sketches. Sketch'y, a. *-ĭ*, containing an outline only; slightly finished; incomplete. Sketch'ily, ad. *-ĭ-lĭ*. Sketch'iness, n. *-nĕs*, the state of being sketchy; incompleteness. Sketch-book, a book formed of drawing-paper, used for sketching in.—Syn. of 'sketch, n.': outline; delineation; plan; draught; diagram;—of 'sketch, v.': to depict; paint; draw; portray; design.

SKEW, a. *skū* [Ger. *schief;* Dut. *scheef;* Icel. *skeifr;* Dan. *skiev*, oblique, wry: comp. Gr. *skaios;* L. *scævus*, left]: wry; distorted; oblique; intersected at an angle greater or less than a right angle: N. in *masonry*, an oblique arch; anything sloping from another at an obtuse angle, e.g., a sloping water-table, as on the set-off of a buttress, cope of a gable, etc. The large stone at bottom is called the skew-put or skew-corbel. Skew, v. in *OE.*, to form in an oblique way; to look obliquely; to squint. Skew-back, an abutment which slopes to receive the arch. Skew-bald, a. piebald, applied to horses. Skew bridge, a bridge carrying a road or railway over and above another road, canal, or river not at right angles to it, but at some other angle, in order better to maintain the directness of the new track. Such bridges are not easy of construction in stone, owing to the peculiar twisted forms which the voussoirs assume, and were scarcely ever used till the necessities of railway curves compelled their introduction. They are evidently a great improvement on the earlier mode of twisting a road, first to the right, then to the left, in order to bring the bridge at right angles to the place to be crossed. Since introduction of iron girders as supports of bridges, skew bridges have become easy of construction, and are in general use.



Skew Bridge.



Skew.

SKEWER, n. *skū'ėr* [Sw. *skifva;* Icel. *skifa*, a slice]: a pin of wood or iron for fastening meat to a spit, or for keeping it together while roasting: V. to fasten with skewers; to pierce, as with a skewer. SKEW'ERING, imp. SKEW'ERED, pp. *-ėrd.*

SKIAGRAPH, n. *skī'ă-grăf* [Gr. *skia*, shadow, + *graphō*, write]: a permanent shadow-picture, produced by Roentgen rays (q.v.) passing through the object and falling on a sensitive photographic film. Numerous other names have been given to the picture thus produced, as 'radiograph,' 'skotograph,' 'cathode photograph,' etc.

SKIBBEREEN, *skĭb-bėr-ēn:* market-town of the county of Cork, Ireland; lat. 51° 34′ n., long. 9° 16′ w.; 52 m. s.w. from Cork. It is a place of little commerce, and almost no manufactures. Pop. (1881) 3,631, of whom 3,209 were Rom. Catholics.

SKID, n. *skĭd* [Icel. *skid*, a billet of wood: Ger. *scheit*, a splinter]: piece of wood to facilitate and control the sliding of heavy weights; a piece of timber placed or hung against a ship's side to preserve it from injury by the rubbing of heavy rough bodies against it; any timber used as a base to keep one object from resting on another: a sliding-wedge or a chain to stop the wheel of a carriage or wagon turning, in descending a steep; a drag: V. to check with a skid. SKID'DING, imp. SKID'DED, pp.

SKIDDAW, *skĭd'aw:* mountain in Cumberland, England, near the centre of the county; height 3,054 ft. A few m. s. are Derwent Water and the town of Keswick.

SKIFF, n. *skĭf* [F. *esquif;* Ger. *schiff;* L. *scapha;* Gr. *skaphē*, a boat (see SHIP)]: a small light boat: V. to pass over in a light boat. SKIF'FING, imp. SKIFFED, pp. *skĭft.*

SKILL, n. *skĭl* [Icel. *skil*, separation, distinction: Dan. *skiel*, a separation; *skille*, to sever, to put asunder: Gael. *sgiol*, to separate: AS. *sculan*, to distinguish]: great readiness and ability in the practical application of any art, science, or handicraft; knowledge derived from practice; art; dexterity; in *OE.*, reason; cause. SKILLED, a. *skĭld*, having great readiness and ability; expert; knowing; dexterous. SKILFUL, a. *skĭl'fûl*, well versed in any art, science, or handicraft; able in management; expert; discriminating. SKIL'FULLY, ad. *-lĭ*. SKIL'FULNESS, n. *-nĕs*, the quality of possessing skill; ability derived from experience. SKIL'LESS, a. in *OE.*, wanting skill; artless.—SYN. of 'skill': ability; capacity; capability; genius; talent; cleverness; dexterity; adroitness; expertness; art; aptitude; knowledge;—of 'skilful': adroit; clever; skilled; dexterous; adept; masterly; knowing; able.

SKILLET, n. *skĭl'lĕt* [OF. *escuellette*, a little dish; *escuelle*, a dish—from L. *scutel'la*, dim. of *scutra*, a dish, a tray]: small metal vessel with a long handle, used for heating water.

SKIM, v. *skĭm* [a form of SCUM, which see]: to take off the scum, thence to move lightly over the surface of a liquid; to clear of scum or floating matter; to pass very near the surface; to glide along; to pass lightly; to glide smoothly; to read superficially, as a book. SKIM'MING, imp.: N. the act of taking off that which floats upon a liquid: PLU. that which is removed from the surface of a liquid by skimming. SKIMMED, pp. *skĭmd*. SKIMMER, n. *skĭm'mėr*, one who or that which skims; a scoop used for skimming liquors. SKIM'MINGLY, ad. *-lĭ*. SKIMMED MILK, or SKIM-MILK, milk from which the cream has been taken.

SKIMBLE-SCAMBLE, a. *skĭm'bl-skăm'bl* [imitative and reduplicated words]: in *OE.*, wandering; wild; worthless.

SKIMMER, *skĭm'mėr:* sea-bird of a number of species, named from their flight near the surface of the sea when pursuing their aquatic prey, and belonging to the family of gulls and terns, *Laridæ*. The shape of their bill is very remarkable. The Black Skimmer (*Rhynchops nigra*) is the American species, rare n. as far as New Brunswick, more common from N. J. s. to Rio Janeiro, and reported on the w. coast. It has been called also the Razor-billed Shearwater, and Scissors-bill. The lower mandible is very long (4–4½ in.) and compressed, as knife-like below as are the upper edges, which fit into a groove in the comparatively short upper mandible; this is compressed, and moves on an elastic joint in the forehead. The plumage is black, with forehead, cheeks, under-parts, tips of secondaries, and lateral tail feathers white—sometimes tinged with roseate. The young are gray, brown, and white. The nest is a hollow in the sand of the coast, where the birds rest by day, taking their swift, graceful flight after prey at night. The eggs, 1¾ × 1⅜ in., white, black-blotched, are often gathered for food.

SKIMMINGTON, n. *skĭm'mĭng-tŏn*, or SKIM'MERTON, n. *-mėr-tŏn:* in *OE.*, a burlesque procession in ridicule of a man who suffered himself to be beaten by his wife.

SKIN, n. *skĭn* [Dan. *skind;* W. *cen*, skin: Icel. *skinn*, skin, fur: Ger. *schinden*, to skin]: external and natural covering of an animal's body (see below); hide; body; person: bark of a plant; husk or rind of fruits or seeds: V. to strip the hide or covering from; to flay; to cover with skin; to acquire a skin; to cover superficially. SKINS, n. plu. *skĭnz*, the pelts of small animals, as of sheep, goats, or seals. SKIN'NING, imp. SKINNED, pp. *skĭnd:* ADJ. covered with a skin. SKINNER, n. *skĭn'nėr*, one who deals in skins. SKIN-DEEP, superficial; slight. SKIN'LESS, a. *-lĕs*, having no skin. SKIN'FLINT, a very niggardly person. SKIN-WOOL, n. wool plucked from the dead sheep. SKIN'FUL, n. *-fûl*, all that the stomach can hold. SKIN'-MOTH, or SKIN'-EATER, popular name of different genera of the family of coleopterous insects *Dermestidæ*, whose larvæ prey on furs and skins, also on zoological specimens in museums, hence the name given to one species of *Dermestes*, *Anthrenus musæorum*. Benzine destroys them. In preparing the skins of animals for museums, arsenic is employed as a means of warding off the attacks of these insects. SKIN'NY, a. *-nĭ*, extremely thin; emaciated. SKIN'NINESS, n. *-nĭ-nĕs*, the quality of being skinny. ESCAPE WITH THE SKIN OF THE TEETH, to escape with life only.

SKIN: outer investment of an animal's body. Considered in its general physiological and histological (or textual) relations, the S. is merely a part of the great mucous system to which the mucous membrane and secreting glands also belong, and which consists of two essential elements—a *basement tissue*, composed of simple cutaneous membrane, and an *epithelium* of nucleated particles resting on it—while beneath the basement membrane are vessels, nerves and connective tissue: see EPITHELIUM: MUCOUS MEMBRANES: SKELETON. In the S., the hard, non-vascular outer layer is termed *cuticle* or *epidermis*, and the true S. below it is termed the *derma* or *cutis vera*, and is formed chiefly of modified and very dense connective (or areolar or cellular) tissue.

The external surface of the S. formed by the cuticle is marked by furrows of different kinds. Some (furrows of motion) occur transversely in the neighborhood of joints, on the side of flexion (see CHIROMANCY); others correspond to the insertion of cutaneous muscles; while others, of quite another kind, are seen in aged and emaciated persons, and after the subsidence of any great distention of the integument; and besides these coarse lines, most parts of the S. are grooved with very minute furrows, which assume various courses in relation to one another. These minute furrows are most distinctly seen on the palmar aspect of the hand and fingers, and on the sole of the foot. Probably in no two individuals are these furrows identical: hence the imprint of the palmar surface of the thumb is an infallible means of personal identification, and is used by police authorities as part of a system of 'criminal anthropometry.' The outer surface of the S. presents also innumerable pores for discharge of the contents of the sweat and fat glands; and the modifications of epidermis known as hair and nails occur on the same surface.

The deep layer of the S. consists of connective tissue, in which both the white and yellow fibrous elements are considerably modified as to the proportions in which they occur, and smooth muscles are present in considerable quantity in some parts of the S. Where great extensibility, with elasticity, is required, the yellow (elastic) element predominates; where strength and resistance are specially required, as in the sole of the foot, the *cutis* is composed chiefly of a dense interweaving of the white (inelastic) element. The thickness and strength of this layer differ greatly in different parts, according to the amount of resistance required against pressure. The S. is thicker on the hinder surface of the body than in front, and on the outer than on the inner sides of the limbs. It is unusually thin over the flexures of the joints. It is particularly delicate in the eyelids, and proportionably so in some other situations where great mobility is demanded. In regions most subject to external pressure, as the soles of the feet, it is firmly united by very dense laminæ to the subcutaneous fascia; and the intervals between these are provided with pellets of fat, forming a cushion as additional protection to the delicate organs which it incloses and covers. Among the lower animals, are numberless examples of analogous kind. The blubber of the whale merely represents, in very exaggerated form, the layer of fat which generally occurs in the subcutaneous areolar tissue of man and most animals, serving as a soft bed on which the S. may rest, and gives the appearance of plumpness and symmetry to the outline of the body. It is on the external surface of the cutis that the *tactile papillæ*, or true organs of touch, are developed. Kölliker divides the true cutis into the 'reticular' and 'papillary' portions, the latter being the reddish-gray external superficial layer which contains the upper portion of the hair follicles and cutaneous glands, and whose most important element is these tactile papillæ. They are most abundant and largest in the palm of the hand and the sole of the foot, while in the back and in the outer sides of the limbs, they are almost entirely absent. They occur as small, semi-transparent, flexible elevations (see *b*, fig. 1), which are usually conical or club-shaped in form; but in certain parts, as the palm of the hand, present numerous points, and are

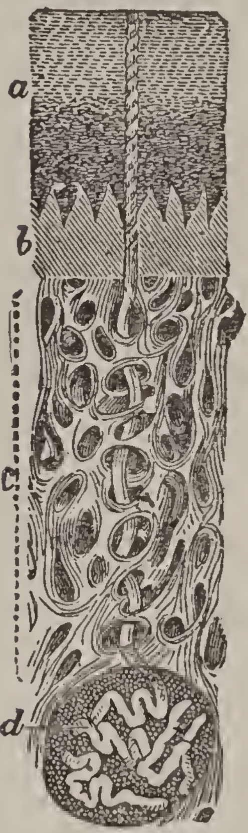


Fig. 1.—Vertical Section of the Skin of the Sole.

a, Cuticle; *b*, Papillary structure; *c*, *Cutis vera*, or true skin; *d*, Sweat-gland lying in a cavity on the deep surface of the skin, and imbedded in globules of fat. Its duct is seen passing to the surface. Magnified about 30 diameters.

termed compound papillæ. In one sq. line of the palm of the hand, E. H. Weber reckons that there are 81 compound, and 150 to 200 smaller papillæ, arranged in nearly regular rows.

The thickness of the true S. varies, according to Kölliker, from one-eighth of a line to a line and a half. In its chemical characters, it agrees with those of the connective tissue, of which principally it is composed. The gelatine which it yields on boiling is derived mainly from the white fibrous tissue, and probably this element is principally concerned in the changes which S. undergoes in the process of tanning. Arteries from the subcutaneous connective tissue freely enter into the structure of the S., and are distributed to the fat-lobules, the sudoriparous and sebaceous glands (described below), the hair follicles, the papillæ, etc. In these several parts, they terminate in a close network of capillaries. The two accompanying diagrams illustrate the mode in which these capillaries are distributed over the fat-

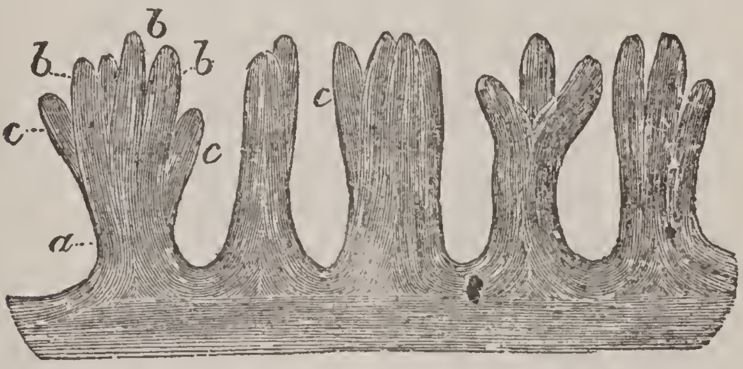


Fig. 2.—Compound Papillæ of the Surface of the Hand, with Two, Three, and Four Points:

a, Base of a papilla; *b*, *b*, their separate processes; *c*, *c*, Processes of papilla when base is not visible. Magnified 60 diameters.

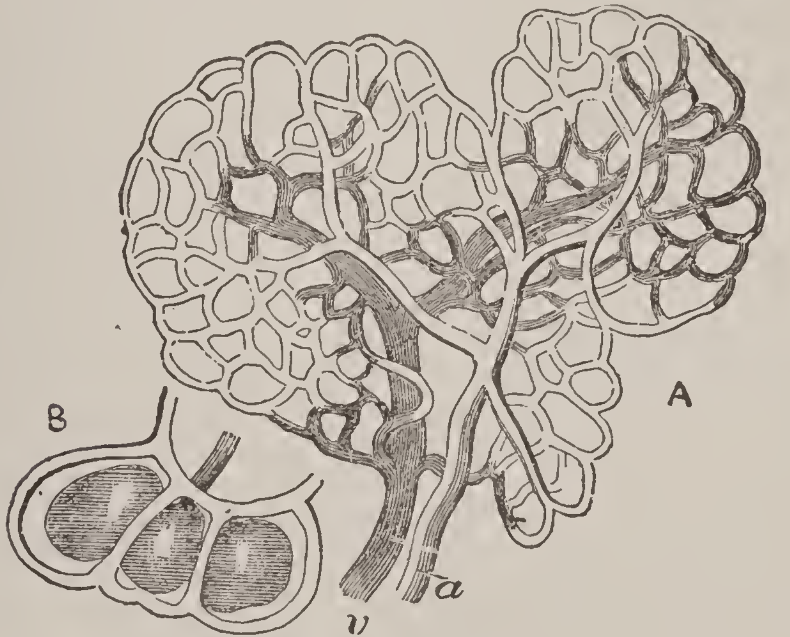


Fig. 3.—Blood-vessels of Fat:

A, Minute flattened fat lobule, in which the vessels only are represented; *a*, Terminal artery; *v*, Primitive vein. Magnified 100 diameters. B, Plan of arrangement of the capillaries on the exterior of the vesicles, more highly magnified.

cells and in the papillæ. Those parts of the S. which border on the epidermis are mostly very freely provided with nerves, while in the deeper parts the nervous filaments are comparatively scanty. The nerves of the S. are branches both of the spinal and of certain cranial nerves. As these nerves pass toward the papillæ they unite to form a nerve plexus, from which smaller branches go out to enter the papillæ; there, especially in the S. of the palm of the hand and sole (the portions of the body most sensitive to touch-impressions), they terminate in the *touch-corpuscles* discovered by Wagner and Meissner. These touch-corpuscles are either single or compound, and usually are ovoid in form: to each single corpuscle and to each division of a compound one is distributed a medullated nerve fibre.

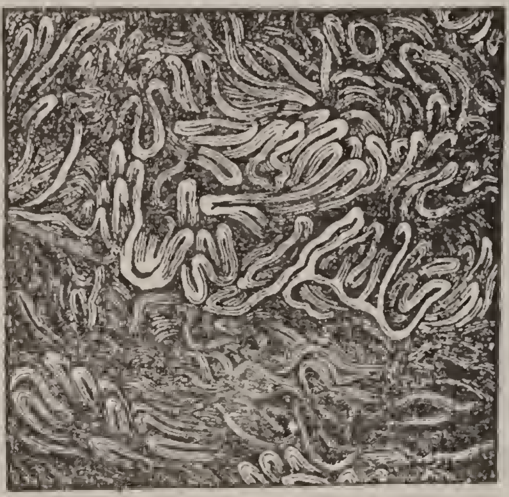


Fig. 4.—Arrangement of the Capillary Loops in the Skin.

The glands in the S. next claim consideration. They are the *sudoriparous* or *sweat glands*, the *sebaceous* or *fat glands*, and the *ceruminous glands*. The *Sweat-glands* exist in almost every part of the human S.; they lie in small pits in the deepest parts of the true S., and sometimes entirely below the skin. Their orifices can be seen in the middle of the cross-grooves that intersect the ridges of the papillæ on the hands and feet, their arrangement being here necessarily regular, while in other parts they are irregularly scattered. Their size and number in different regions of the S. correspond with the amount of perspiration yielded by each part; thus, they are nowhere so much developed as in the axilla, or armpit. In that part of this region, which in the adult is more or less covered with hair, they form a layer of reddish color, about an eighth of an inch thick. They are soft, and more or less flattened by their pressure on one another, being imbedded in delicate connective tissue, and covered and permeated with a network of capillaries. On isolating one of these glands, and highly magnifying it, it is found to consist of

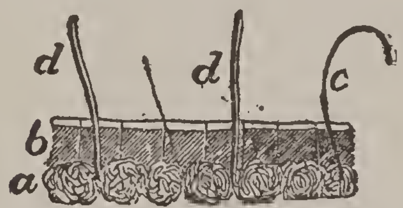


Fig. 5.—Vertical Section of the Skin and Sweat-glands of the Axilla.

a, Layer of glands with their ducts traversing *b*, the cutis and cuticle; *c*, A small hair; *d*, *d*, Portions of larger hairs. Magnified one and a half diameters.

a solitary tube, intricately convoluted, one end of which is closed, and hidden within the glandular mass, while the other emerges from the gland. The wall of the tube consists of an outer or *basement membrane*, with which the blood-vessels are in contact; and an *epithelium*, lining the interior; the former disappearing where the tube reaches the surface of the papillæ. The duct, on leaving the gland, follows a spiral direction through the reticular portion of the cutis to the interval between the papillæ, when it becomes straight; and it again assumes a spiral course in perforating the cuticle (see fig. 1). It is not easy to explain how or why so beautifully regular a spiral form should be given to the cuticular portion of the duct, which is rather wider than the rest, the average diameter of the duct being $\frac{1}{1700}$ of an inch.

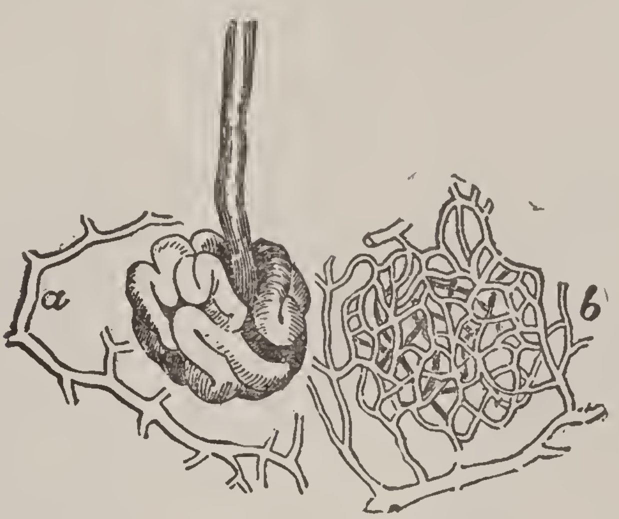


Fig. 6.—A Sweat-gland and the Beginning of Its Duct: *a*, Venous radicles on the wall of the gland; *b*, Capillaries. The vessels are all outside. Magnified 35 diameters.

The *sebaceous glands* are small whitish glands, which exist in almost every part of the S., except the palms and soles, and are abundant especially in the scalp, face (the nose particularly being rich in them), and about the anus. They are usually connected with the hairs, as shown in fig. 7, and consist of a duct terminating in a blind pouch-like or pear-shaped extremity. The *basement membrane* of these glands is lined by an epithelium, in whose particles are included granules of fatty or sebaceous matter, which, having become detached, constitutes the secretion. These glands are the seat of the parasite *Acarus folliculorum.*

The *ceruminous glands* are brown simple glands, in external appearance like the sudoriparous glands, occurring in the cartilaginous portion of the external meatus of the ear. They yield an adhesive bitter secretion, which protects the membrane of the tympanum from access of dust, insects, etc.

It is an interesting fact that certain outgrowths not ordinarily regarded as S. are really transformations of cuticle, such as hair, horns (the skeleton core of certain horns excepted), and finger-nails—the latter formed by an infolding and thus duplication of the cuticle. Even teeth belong to the S. (formed in its invaginations, like hairs), though set in sockets of the jaw; in many animals, chiefly fish, they are plainly transformations of S., without sockets, and occur on any part of the mouth, e.g., the tongue (snails)

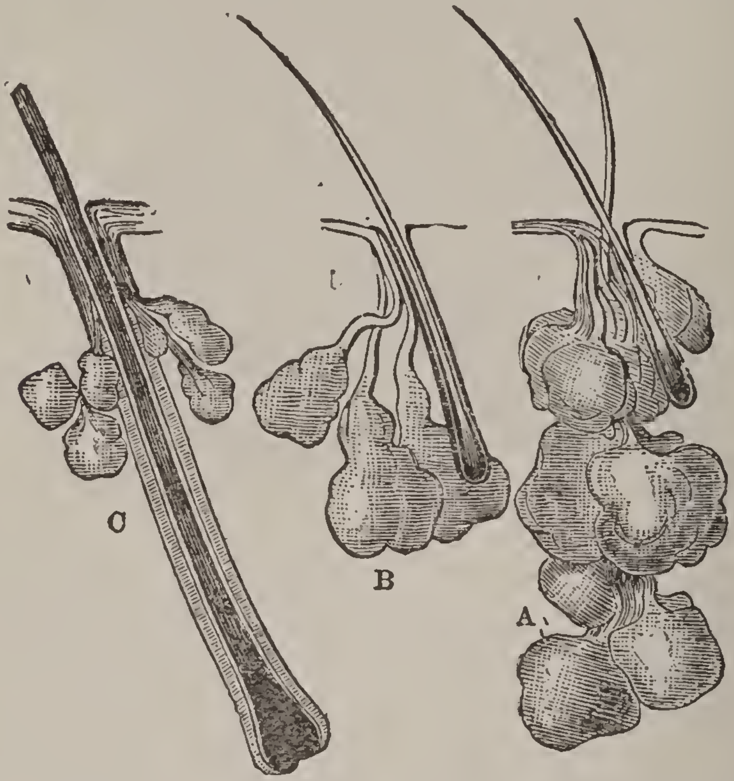


Fig. 7.–Sebaceous Glands, showing their Size and Relation to the Hair-follicles:

A and B, From the nose; C, From the Beard. Magnified 18 diameters.

(With two exceptions, the diagrams in this article are borrowed from Todd and Bowman.)

We conclude with brief survey of the functions of the S., omitting, however, its most important function, TOUCH (q.v.). Regarded as a protective covering, the S. possesses the combined advantages of toughness, resistance, flexibility, and elasticity; the connective framework being the part which mainly confers these properties, though the epidermis co-operates with it. The subcutaneous layer of fat, and the modifications of epidermis in various forms, e.g., hairs, wool, feathers, scales, etc., serve for preservation of warmth, and occasionally (when they occur as claws, talons, etc.) as means of offense or defense. The S. is the seat of a twofold excretion—viz., that formed by the sudoriparous glands, and that formed by the sebaceous glands. The fluid secreted by the sudoriparous glands is usually formed so gradually that it evaporates as soon as it reaches the surface; but in certain conditions, as during strong exercise, or when the external heat is excessive, or in certain diseases, or when the evaporation is prevented by application of a texture impermeable to air, the secretion collects on the S. in the form of drops of fluid. When it is stated that the sweat contains urea, lactates, extractive matters, etc., and that the amount of watery vapor exhaled from the skin is, on an average, 2½ lbs. daily (according to Valentin's observation), the importance of the sudoriparous glands as organs of excretion is manifest. Moreover, there is reason to believe that the importance of the S. as a *respiratory* organ is considerable, very appreciable quantities of carbonic acid being exhaled hourly by the external surface of the body.

The excretory function of the S. has a very important relation to that of the mucous membrane which lines all the open cavities of the body, and is really a continuation inward of the outer S., so that a true view of the two is that in many respects they are one organ; hence, when, under some conditions, the outer S. is chilled and its pores closed, its work is thrown as an additional burden on the inner S. or mucous lining, and congestion ensues, such as colds, pulmonary inflammation, bowel troubles, etc. A prime requisite to recovery, and to health in general, is to keep the S. clean and active.

The secretion of the sebaceous glands is a semi-fluid oily mass, which often solidifies into a white viscid tallow-like matter on the surface or in the glandular ducts, from which it can be removed by pressure, in a form resembling that of a small whitish worm or maggot. Under the microscope, are observed cells containing fat, free fat mixed with epidermic scales, and sometimes crystals of cholesterin. Its chemical constituents, in addition to water, are a peculiar nitrogenous matter resembling casein, fat (consisting of palmitin and olein, soaps composed of palmitic and oleic acids), cholesterin, earthy phosphates, and chlorides and phosphates of the alkalies. Its purpose seems to be that of keeping the skin moist and supple, and by its oily nature, of hindering too rapid evaporation. Moreover, considered as an excretion, it must share in the purification of the blood.

The S. is, moreover, an organ of absorption: mercurial preparations, rubbed into the S., have the same action as when given internally. Potassio-tartrate of antimony, rubbed into the S. in the form of ointment or solution, may excite vomiting, or an eruption extending over the whole body; and many similar illustrations might be given. The effect of rubbing is probably to force the particles of the matter into the orifices of the glands, where they are more easily absorbed than through the epidermis. It has been proved by experiments of Madden, Berthold, and others, that the S. has the power of absorbing water, though to a less extent than in thin-skinned animals, such as frogs and lizards. This fact has a practical application. In severe cases of dysphagia—difficult swallowing—when not even fluids can be taken into the stomach, immersion in a bath of warm water, or of milk and water, may assuage the thirst. Sailors, also, when destitute of fresh water, find their urgent thirst somewhat allayed by soaking their clothes in salt water.

The *diseases* of the S., and their classification into genera and species, have occupied much attention; but none of the proposed classifications is satisfactory. For the more important affections, see special articles. See ECZEMA: ECTHYMA.

SKINCH, v. *skĭnch:* to stint, to scrimp; to give short allowance.

SKIN'-GRAFTING: operation in plastic surgery, by which skin is transplanted to a denuded surface. The idea of S.-G. appears to have occurred first to Dr. Frank H. Hamilton, of New York, who proposed to plant *in the centre* of an ulcer a piece of healthy skin; he suggested that the graft would grow out by proliferation of its cells from all its borders toward the natural skin around the ulcer. But the method of skin-grafting now in use was devised 1869 by Dr. J. L. Reverdin, surgeon in Paris. In this method the grafts are from the epidermis, taken from such portions of the bodily integument as are softest and most flexible, e.g., from the inside of the thigh flexure, or of the elbow, etc. Using all precaution against septicæmia, the surgeon takes a portion of epidermis, and, having cut it into pieces about the size of the head of a pin, first carefully smooths out the minute graft, and then applies it to the ulcerated surface at the distance of ¼ to ½ in. from the edge af the ulcer; then another and another at like distances, and so on. The grafts grow toward each other and toward the margin till the denuded surface is covered. The ingrafted skin may be taken from the subject under operation, or from another person, or even from an animal: see Rhinoplastic Operation.

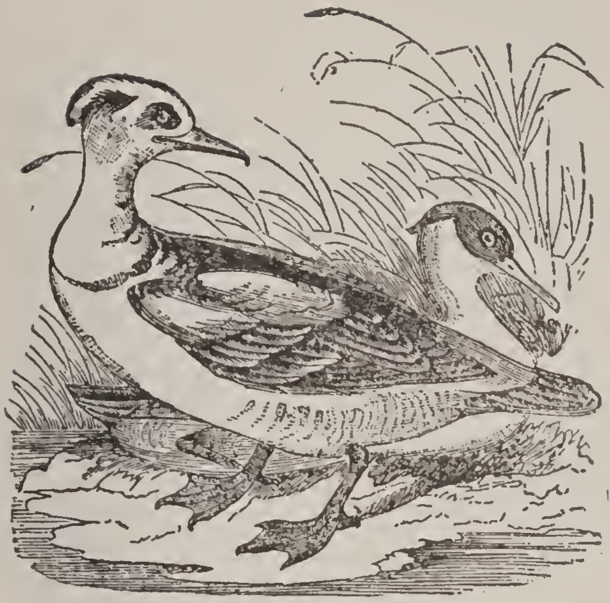
SKINK, n. *skĭngk* [AS. *scenc*, a drink: Icel. *skenkja;* Ger. *schenken*, to pour out, to serve with wine]: in *OE.*, drink; anything potable; pottage: V. to serve with drink. Skink'ing, imp. Skinked, pp. *skĭngkt.* Skink'er, n. one who serves drink.

SKINK, or Scink, *skĭngk:* any species of family *Scincidæ,* a group of lizards with long, round neck, trunk, and tail, covered with mostly smooth scales in quincunx arrangement, the head with angular plates, and the sides of the body without folds. They are harmless, living in concealment, natives of the tropics and warm temperate zone, and feed on insects and worms. There is every gradation in the development of the legs, according to some authors, while other authorities make separate families of those with two members wanting or with none visible, such as the imperfect-limbed *Seps* and the limbless and still more snake-like *Anguis*, or 'slow-worms.'

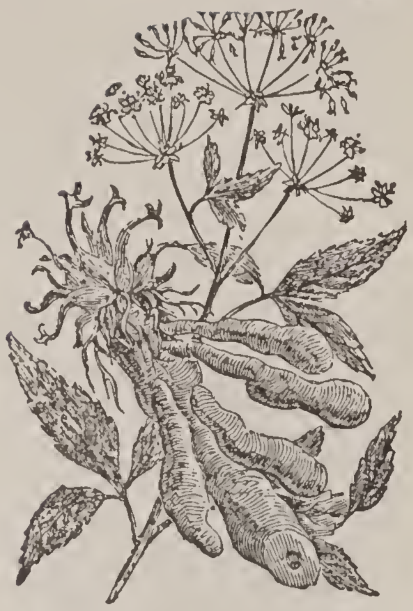
The most common species in the prairie region of the Mississippi valley is the Five-lined S. (*Euprepes quinquelineatus*), small, with five whitish lengthwise lines on the olive-brown back; and the same species is reported 10 in. in length, toward the Gulf of Mexico. Another American species, if distinct, is the Blue-tailed S. (*Eumeces fasciatus*); also the Ground S. (*Oligosoma laterale*), not uncommon. The so-called Great Galliwasp (*Diploglossus occiduus*) of Jamaica is more than 20 in. long. A threefold subdivision of the family has been characterized by the eyes—those with two lids, those with rudimentary lids, and those with concealed eyes.

The S. or Adda of Arabia and Africa (*Scincus officinalis*)

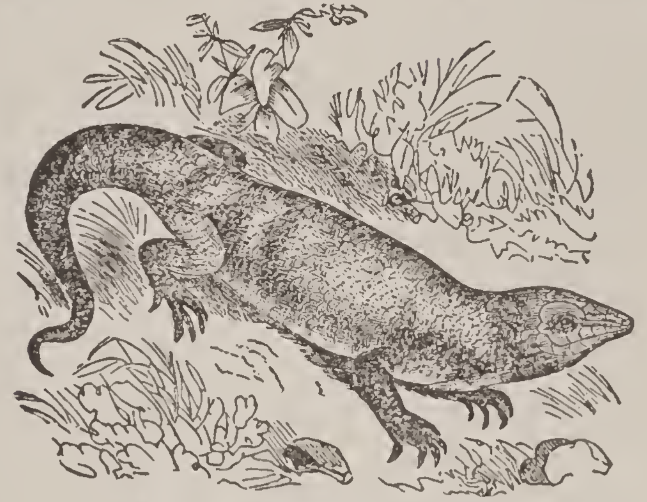
PLATE 1.



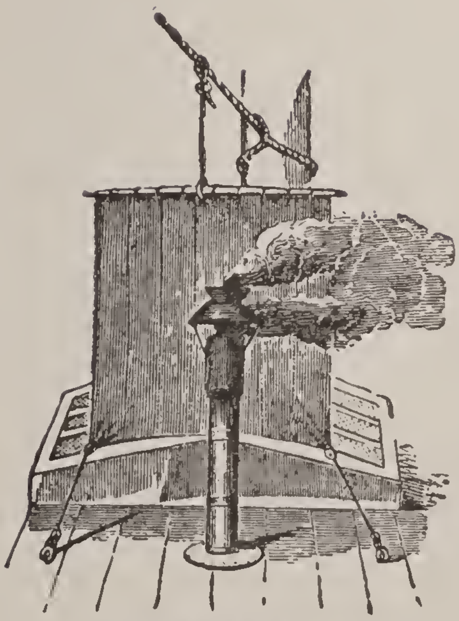
Smew (*Mergellus albellus*).



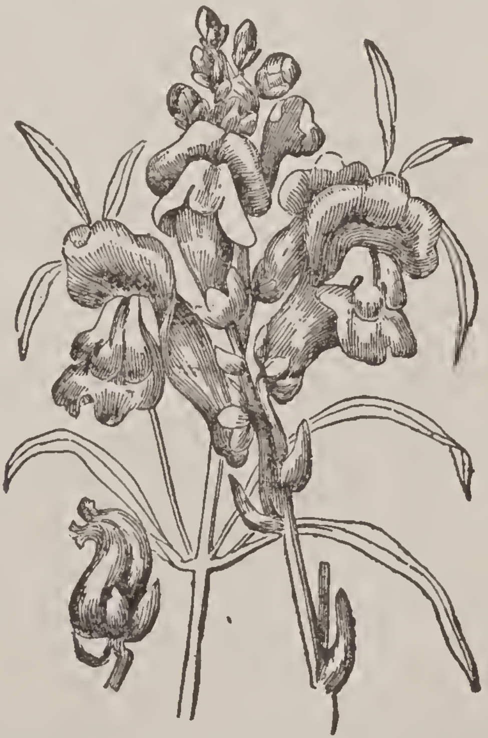
Skirret (*Sium Sisarum*).



Skink (*Scincus officinalis*).



Smoke-sail.



Snapdragon (*Antirrhinum majus*).

is six to eight inches long, generally of reddish-dun color, with darker transverse bands, a wedge-shaped head, and four strong limbs. It has been in great repute for imaginary medicinal virtues from remote times; it was largely imported on this account into ancient Rome, and is still in high esteem in the East, dried skinks finding ready sale in many places, e.g., Cairo and Alexandria. There is almost no disease for which it has not been supposed to be a cure.

SKINNER, *skĭn'ėr*, THOMAS HARVEY, D.D., LL.D.: 1791, March 7—1871, Feb. 1; b. Harvey's Neck, N. C.: Presb. divine and author. After graduation at Princeton 1809, and studying law, he became a theol. student at Princeton. He was associate pastor with Dr. Janeway, Philadelphia, 1813–16, when he was called to the Fifth Presb. Church in Arch street in that city. After two years at Andover as prof. of sacred rhet., he became 1835 pastor of the Mercer Street Presb. Church, New York; and from 1848 until his decease was prof. of sacred rhet. and pastoral theol. in Union Theol. Seminary, New York. His reputation was wide as a logical sermonizer, effective preacher, successful teacher; and as author of valued books, among which were: *Aids to Preaching and Hearing* (1839); *Hints to Christians* (1841); *Vinet's Pastoral Theology* and *Homiletics* (1854); *Discussions in Theology* (1868); and *Thoughts on Evangelizing the World* (1870).—His son, THOMAS HARVEY S., D.D., was pastor of the Carmine Street Presb. Church, New York, and of a Reformed (Dutch) church on Staten Island, and of the Fourth Street Presb. Church, Cincinnati; prof. in the Allegheny Presb. Theol. Seminary; and prof. of theol. in the McCormick Theol. Seminary, Chicago.

SKIP, v. *skĭp* [W. *cip*, a sudden snatch or effort: Gael. *sgiab*, to start or move suddenly: Icel. *skoppa*, to spin round]: to leap lightly; to spring or bound as a goat; to pass over; to omit: N. a light leap; a bound; in *sugar-making in W. I.*, a charge or strike of syrup from the coppers. SKIP'PING, imp.: ADJ. leaping lightly; bounding. SKIP'PINGLY, ad. *-lĭ.* SKIPPED, pp. *skĭpt.* SKIP'PER, n. one who skips; the cheese-maggot; name sometimes given to the saury pike, *Scomberesox saurus.* TO SKIP OVER, to pass without notice; to omit. SKIP-JACK, an upstart; a lackey. SKIPPING-ROPE, a cord, generally mounted with handles, used by children in skipping in play.

SKIP, n. *skĭp* [see SKIP 1]: in the Scotch game of *curling*, the last of his party or side who plays; the captain or leader of his team: V. to hurl the stone along the ice; to make a thin stone skim along the surface of water. SKIP'PING, imp. SKIPPED, pp. *skĭpt.*

SKIP: basket, box, etc.: see SKEP.

SKIPPER, n. *skĭp'pėr* [Dut. *schipper*, a sailor—from *schip*, a ship (see SHIP)]: the master of a trading or merchant vessel. SKIP'PET, n. in *OE.*, a small boat.

SKIPPET, n. *skĭp'ĕt:* in *archeol.*, a small cylindrical turned box, with a lid or cover, for keeping records.

SKIPTON, *skĭp'ton:* market-town of England, county of York; finely situated in a broad and fertile valley, near the river Aire, about 38 m. w. of York, and 16 n.n.w. of Bradford. S. manufactures cotton and woolen goods, and is a station on the Leeds and East Lancashire railway and on the Midland line. Pop; (1891) 10,376.

SKIRMISH, n. *skėr'mĭsh* [OF. *escarmouche;* Ger. *scharmützel;* It. *scaramuccia*, a skirmish: OHG. *scirman.* to defend, to fight]: an encounter of a few men when they fight in confusion; a slight combat between detachments and small parties from the main armies: V. to fight slightly or loosely in small or detached parties. SKIR'MISHING, imp.: N. the act of fighting lightly in small parties: ADJ. fighting in a loose desultory manner, as *skirmishing* parties. SKIR'MISHED, pp. *-mĭsht.* SKIR'MISHER, n. *-mĭsh-ėr*, one who skirmishes.—Skirmishers operate in loose array, two together —i.e., front and rear, with a lateral distance of about six paces between the files. When the army advances, the ground in front and for some distance on each flank is usually covered by skirmishers, to prevent surprise. If cavalry come suddenly on them, they rush together, and form small squares, called rallying squares. Skirmishers fire independently at their own discretion; but the rule is, that one of the two men composing a file should always have his rifle loaded. Orders are communicated by sound of bugle. Each company of skirmishers has a reserve force to fill the places of men who drop out, and to supply ammunition, etc.

SKIRR, v. *skėr* [Low Ger. *schurren*, said of a thing that makes a noise by rubbing along the ground; *schirren*, expressing a clearer noise: Ger. *scharren*, to scrape with the feet]: in *prov. Eng.* and *OE.*, to glide or move quickly; to graze, skim, or touch; to scour; to run in haste. SKIR'RING, imp. SKIRRED, pp. *skėrd.*

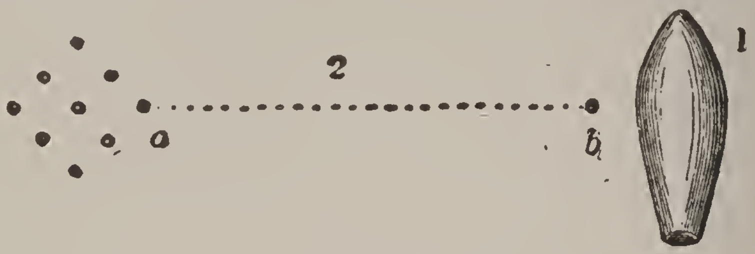
SKIRRET, n. *skĕr'rĕt* [said to be a corruption of *sugar-wort* or *sugar-root*], (*Sium Sisarum*): perennial plant of nat. order *Umbelliferæ*, native of China and Japan, but long cultivated as the Water-parsnip in gardens in Europe for its roots, which are tuberous and clustered, sometimes 6 in. long, and of the thickness of the finger. They are sweet, succulent, and nutritious, with a somewhat aromatic flavor, and when boiled are agreeable food. A kind of spirituous liquor is sometimes made from them: good sugar also can be extracted. S. is less cultivated than formerly. It is propagated either by seed or by very small offsets from the roots. It has a stem 2–3 ft. high; the lower leaves pinnate, with oblong serrated leaflets, and a heart-shaped terminal leaf, the upper ones ternate, with lanceolate leaflets.

SKIRT, n. *skėrt* [Icel. *skyrta*, a shirt: Dan. *skiört;* Sw. *skorte*, a skirt: a doublet of SHIRT, which see]: the loose part of a coat or garment below the waist; the edge of any part of a dress; the lower portion of a dress; an upper petticoat; border; margin; among *butchers*, the midriff: V. to border; to form the border or edge of; to be on the border;

to go along the edge of; to live near the extremity. SKIRT'ING, imp.: N. material for women's skirts: in *arch.*, the narrow upright boarding placed round the margin of a floor; called also wash-board, mop-board, base-board; and, when large, base-plinth. SKIRT'ED, pp.

SKITTISH, a. *skĭt'tĭsh* [see SHOOT: Sw. *skutta,* to leap]: humorsome; frisking; wanton; volatile; shy; easily frightened; fickle; changeable. SKIT'TISHLY, ad. *-lĭ.* SKIT'TISHNESS, n. *-nĕs,* the state of being skittish; wantonness. SKIT, n. *skĭt,* a squib; a lampoon; in *OE.*, a light wanton wench: V. in *prov. Eng.*, to asperse.

SKITTLES, n. plu. *skit-tlz* [the same word as SHUTTLE, which see: Dan. *skyttel;* Sw. *sköttel,* a shuttle]: game played in England since the 14th c., with 9 wooden pins (skittles), which the players knock over with a roundish ball. It is played usually in a covered shed, called a skittle-alley, about 60 ft. in length. The skittles are of hard wood of the shape shown in fig. 1, and they are placed on the floor in the order shown in fig. 2, *a.* The player, standing at *b,* throws a wooden missile, shaped like a small cheese, and tries to knock down the whole of the skittles in a given number of throws. The rules of the game vary in different places. The game of ten-pins (or of nine-pins) does not differ essentially from skittles: it is played with 10 (or 9) pins arranged in the form a triangle; and the missile, a wooden ball, is rolled along a carefully constructed wooden floor. SKITTLE-BALL, a ball for throwing at skittles. SKITTLE-ALLEY, a place where the game of skittles is played.



Skittles.

SKIVERS, n. plu. *skī'vėrz* [Dut. *schiif,* a shive or slice: Dan. *skive,* a thin slice: Icel. *skifa,* to split (see SHIVER)]: split sheep-skins tanned in sumach and dyed, used for bookbinding, etc.

SKOBELEFF, *sko'bĕ-lĕf,* MIKHAIL DIMITRIEVICH: Russian general: 1843–1882, July; b. Riazan; son of a general. He left the milit. acad. 1868, with rank of major; was attached to the Grand Duke Michel in the Caucasus 1871; commanded the advance corps d'armée 1873, seizing Khiva; vanquished the Khokands 1875, and the Kara-Kirghis 1876; and was promoted maj.gen., and gov. of the provinces annexed. His brilliant qualities shone in the Turko-Russian war 1877–8, particularly at Plevna and in the Shipka passage, and later in taking Géok-Tépé in the Turcoman campaign, opening the way to Merv. His success was less on a diplomatic mission afterward to Germany He died suddenly at Moscow.

SKOPIN, *skō-pēn':* town of Russia, govt. of Riazan, 160 m. s.e. of Moscow. Pop. (1880) 9,500.

SKORODITE, n. *skŏr'ō-dīt* [Gr. *skorodon*, garlic]: a hydrous arseniate of iron of a leek-green color, inclining to brown.

SKOWHEGAN, *skow-hē'gan:* town, cap. of Somerset co., Me.; on the Kennebec river, and on the Maine Central railroad; 35 m. n. of Augusta, 50 m. w. of Bangor. It is on both sides of the river, which here falls 28 ft. perpendicularly, affording fine water-power, utilized by many manufactories; and it contains co. court-house, 7 churches, acad., public schools, 2 national banks (cap. $275,000), 1 savings bank, 1 weekly newspaper, and flour, paper, woolen, and lumber mills, and ax, oil-cloth, leather, shoe, and pulp factories. Its principal trade is in lumber, agricultural products, and manufactures. Pop. (1880) 3,860; (1890) 5,068; (1900) 5,180.

SKRAELINGS, n. plu. *skrā'lĭngz* [Icel., dwarfs]: a name given by the old Norsemen to the Esquimaux.

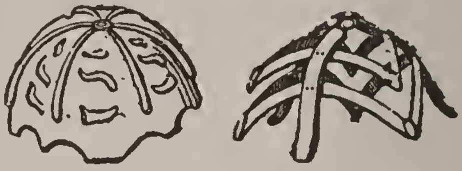
SKREEN, *skrēn:* another spelling of SCREEN, which see.

SKUA, *skū'a*, or SKU'A GULL (*Lestris*): genus of birds of family *Laridæ*, known also by the name JÄGER [Ger., hunter]; differing from the gulls in having the upper mandible more hooked at the tip, and the nostrils larger and further forward in the bill, the base of which is covered with a cere. The skuas are bold and powerful birds, and generally obtain their food by pursuing gulls or terns, and causing them to disgorge the fish which they have captured which they dart upon and seize in the air. They eat also eggs and small birds. The COMMON S. (*L. cataractes*) is fully two ft. in length, of brown color, with lighter streaks on the head and neck. It inhabits the northern seas of Europe, and has been found on the coast of California, a species like it occurring also in the Antarctic regions. The Arctic species (*L. parasiticus*) is smaller, 21 in. long, the central tail feathers projecting: it is found also in n. Europe, and visits the New England coast, and in winter the Gulf of Mexico.

SKULDUDDERY, *skŭl-dŭd-ėr-ĭ*, or SCULDUD'RY, or SKULDUGGERY, n. *-dŭg'ėr-ĭ* [Scotch]: obscenity; grossness of conduct or of speech.—In Mo., the term is applied to underhand plotting (Bartlett, *Dic. Americanisms*).

SKULK, v. *skŭlk* [Dan. *skulke*, to slink, to sneak: **Dan.** *skiul;* Icel. *skjol*, shelter: Low Ger. *schulen*, to conceal one's self, as from shame or fear: Gael. *sgiolg*, to creep or slip in and out]: to get out of the way in a slinking, sneaking manner; to avoid work or duty in a cowardly manner; to lurk: N., also SKULK'ER, n. *-ėr*, one who skulks; one who avoids or shirks duty. **SKULK'ING, imp. SKULKED, pp.** ***skŭlkt.*** **SKULK'INGLY, ad.** ***-lĭ.***

SKULL, n. *skŭl* [Dan. *skaal*, a cup or bowl: Icel. *skal*, a bowl: Sw. *skull* or *skōl;* OE. *schal*, a bowl or drinking-cup: Gael. *sgail*, a covering]: natural bony or cartilaginous covering of the brain, including the head, and supporting the face: head. SKULL-CAP, close cap to fit the upper part of the head; also, *formerly*, an iron defense for the head, within the cap.—The *Skull* as the framework of the head may be considered in two sections, the cranium and the face. In human anatomy, it is customary to describe the former as consisting of 8, and the latter of 14 bones; the 8 cranial bones, which constitute the brain-case, being the *occipital, two parietal, frontal, two temporal, sphenoid,* and *ethmoid;* while the 14 facial bones are the *two nasal, two superior maxillary, two lachrymal, two malar, two palate, two inferior turbinated, vomer,* and *inferior maxillary.* The bones of the ear, the teeth, and the Wormian bones are not included in this enumeration. The morphologist, however; tracing the fundamental similarity of type in the various modifications of the vertebrate S., is not content with this arrangement, in which—e.g., in the occipital, temporal, and sphenoid bones—the human anatomist considers as a single bone an osseous mass consisting primarily in man, and persistently in some lower vertebrates, of several distinct pieces or elements. Postponing to the close of this article any remarks on the structure of the vertebrate S. generally, we notice the ordinary anatomical relations of the human skull. At a very early period of



Iron Skull-caps.

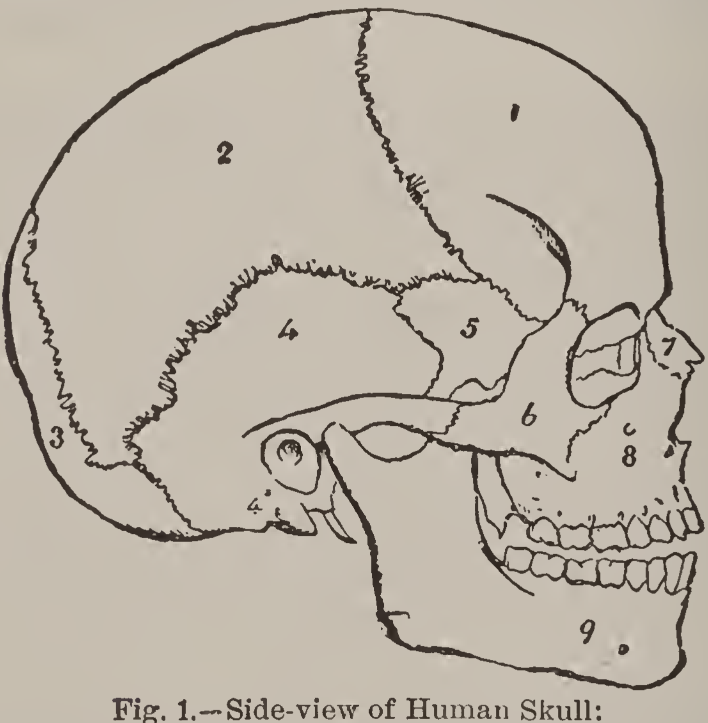


Fig. 1.—Side-view of Human Skull:

1, Frontal bone; 2, Parietal bone; 3, Occipital bone; 4, Temporal bone (squamous portion); 4* Do. (mastoid portion); 5, Sphenoid bone; 6, Malar bone; 7, Nasal bone; 8, Superior maxillary or jaw bone; 9, Inferior maxillary or jaw bone.

fetal existence, the cerebrum is inclosed in a membranous capsule external to the dura-mater, and in close contact with it. This is the first rudiment of the S., the cerebral portion of which is consequently formed before there is any indication of a facial part. Soon, however, four or five processes jut from it on either side of the mesial line, which grow downward, incline toward each other, and unite to form a series of inverted arches, from which the face is ultimately developed. Imperfect development or ossification of these rudimentary parts of the face gives rise to the peculiarities known as 'hare-lip' and 'cleft-palate;' or in extreme cases to the form of monstrosity termed 'Cyclopean,' in which, from absence of the frontal processes, the two orbits form a single cavity, and the eyes are more or less blended in the mesial line.

The events in the ordinary or normal development of the S. are as follows: Cartilage is formed at the base of the membranous capsule, above described as thrown round the brain and capable of enlarging with it. This is speedily followed by deposition of ossific matter at various points of the capsule, which soon becomes converted into flakes of bone affording protection for the brain, while the intervening portions, which remain membranous, permit the S. to expand as its contents enlarge. The formation of these bony flakes on the convexity of the cranium is soon followed by the appearance of osseous nuclei in the cartilage at the base, corresponding to the future occipital and sphenoid bones. Lastly, the various bones, some originating in membrane, some in cartilage (see OSSIFICATION), approach one another by gradual enlargement, and become united in various ways to form a continuous and ultimately unyielding bony case, admirably adapted for

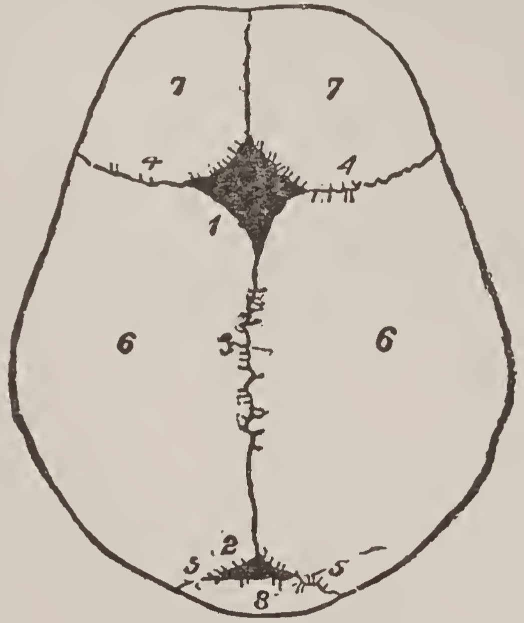


Fig. 2:

1, Anterior fontanelle; 2, Posterior fontanelle; 3, Sagittal suture 4, 4, Coronal suture; 5, Lambdoidal suture; 6, 6, Parietal bones 7, 7, Two halves of the frontal bone, still ununited; 8, Occipital bone.

defense of the brain, for accommodation of the organs of special sense, and for attachment of the ligaments and muscles by which the S. is supported and moved on the spine. At the period of birth, most of the principal bones have grown into apposition with their neighbors, forming the *Sutures* (q.v.); but one large vacuity remains at the meeting-point of the parietal and frontal bones, which is termed the anterior fontanelle, which does not close till the second year after birth, and sometimes remains open much longer. The fontanelle is so called from the pulsations of the brain, which may be here seen resembling the rising of water at a spring or fountain. There are two fontanelles in the mesial line (fig. 2), and two lateral fontanelles on either side (fig. 3). The sutures remain distinct long after the closure of the fontanelles, and probably serve both in permitting increase of size of the cranium by growth of the bones at their edges, and in diminishing and dispersing vibrations from blows, and thus contributing to the security of the brain.

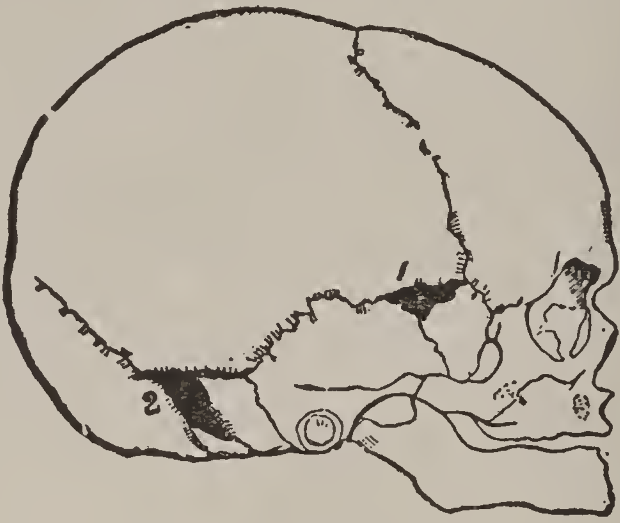


Fig. 3:
1, 2, Lateral fontanelles.

After the sutures have been formed, and the S. has acquired a certain thickness, a process of resorption begins in the interior of the bones, and reduces the originally dense structure to a more or less cellular or cancellated state. The interior thus altered is called the *Diplöe,* and by this change the weight of the S. is much diminished, while its strength is scarcely affected.

The diplöe usually begins to be apparent about the 10th year, and is most developed in those skulls which are thickest. Dr. Humphry, author of *The Human Skeleton*, observed it to be especially thick in idiots and where the brain is small: 'hence,' he observes, 'the propriety of the term *thick-headed,* as a synonym for *stupid*, derives some confirmation from anatomy.' A continuation of the same process of resorption which causes the diplöe gives rise to the cavities known as the frontal and sphenoid sinuses: see SINUS. The formation of the diplöe divides the walls of the cranium into three layers—viz., an outer tough layer; an inner dense, brittle, somewhat glass-like layer, known as the vitreous table or layer; and the intervening cancellous diplöe. The vitreous table, being more brittle than the outer layer, is apt to be fissured to a greater extent in fracture of the S.; and is even sometimes broken while the outer layer, which received the blow, has remained entire; though the diplöe must have great power in lessening the concussions transmitted from the outer to the inner layer of the skull. The growth of the S. after the 7th year proceeds slowly, but a slight increase goes on to about the age of 20. The S.-bones are freely supplied with blood from arteries which pass from the dura-mater internally and the pericranium externally, through the numerous foramina observed on both surfaces; the blood being returned by veins which take various directions.

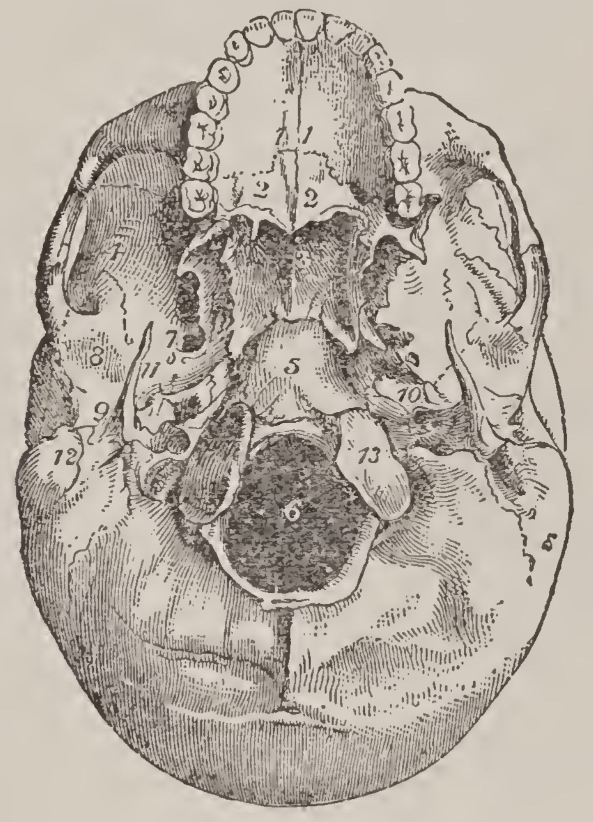


Fig. 4:

1, 1, Hard palate, formed by the palate processes of the superior maxillary bone; 2, 2, Palate bones; 3, Vomer, dividing the openings of the posterior nostrils; 4, Zygomatic fossa: 5, Basilar process of the occipital bone; 6, Foramen magnum, through which the spinal cord passes; 7, Foramen ovale; 8, Glenoid fossa, in which the head of the lower jaw-bone lies; 9, External auditory foramen; 10, Carotid foramen of the left side; 11, Styloid process; 12, Mastoid process; 13, One of the condyles of the occipital bone.

The S. with its rounded shape forms a strong protection for the brain. Its weakest part is at the base, where fracture takes place sometimes when the S. is not broken at the part struck. There are two points remarkable in the architecture of the bones of the face: (1), the great strength of the nasal arch; (2), the immobility of the upper jaw, which is fixed by three buttresses, the nasal, the zygomatic, and the pterygoid.

The base of the S., whether seen from within or from below, presents many objects of physiological interest, in relation to the nervous system. As seen from within, the base presents on each side three fossæ, corresponding to the anterior and middle lobes of the cerebrum and to the cerebellum. These fossæ are marked, as is the whole S.-cap, by the cerebral convolutions; and they contain numerous 'foramina' and 'fissures' which give passage to various sets of nerves and blood-vessels. The external or outer surface of the base of the S., considered from before backward, is formed by the palate processes of the superior maxillary and palate bones; the vomer; the pterygoid and spinous processes of the sphenoid and part of its body; the under-surface of the temporal bones; and by the occipital bone. Its most important parts are named in the description of fig. 4.

The anterior region of the S., which forms the face, is of irregularly oval form; and the bones are so arranged as to inclose the cavities for the eyes, the nose, and the mouth, and to give strength to the apparatus for masticating food. The size of the face and the capacity of the cranial cavity are in an inverse ratio to one another, as may be readily seen by comparing vertical sections (through the mesial line) of human and other mammalian skulls; and if, instead of mammalian skulls, we take skulls of lower vertebrates (the crocodile, e g.), this ratio is far more striking. In man, the face is at its *minimum* as compared with the cranial cavity, chiefly in consequence of the facial bones being arranged nearly vertically beneath the cranium, instead of projecting in front of it. The human face is remarkable also for its relatively great breadth, which allows the orbits for the reception of the eyes to be placed in front instead of on the sides of the head, and renders their inner walls nearly parallel. This parallelism in man is associated with the parallelism of the optic axes, and contributes to that clear, accurate, and steady vision which results from the ready convergence of the eyes upon every object. Each orbit is of pyramidal form, with the apex behind; and is composed of seven bones—the frontal, ethmoid, lachrymal, sphenoid, superior maxillary, malar, and palate, which last contributes very slightly to the human orbit; but is an important constituent in the orbit of many animals. For the nasal cavities, see NOSE.

The different varieties of mankind present certain well-marked and characteristic peculiarities in the form of the S. There are *three typical forms* which seem well established from examination and comparison of a large number of crania—viz., the *prognathous*, the *pyramidal*, and the *oval* or *elliptical* cranium. When the upper jaw slopes forward, the insertion of the teeth, instead of being perpendicular, is oblique. A S. with this peculiarity is *prognathous* or *prognathic* [Gr. *pro*. forward; *gnathos*, jaw]; the opposite condition being termed *orthognathous* or *orthognathic* [Gr. *orthos*, upright]: the Negro of the Guinea Coast and the Negrito of Australia present the prognathous character in its most marked form. The pyramidal form is characterized by the breadth and flatness of the face, which with the narrowness of the forehead, gives this shape to the head: the Mongolian and Esquimaux skulls belong to this type. The oval or elliptical type is presented by the natives of w. or s. Europe and their descendants in N. America; and is not distinguished by any particular ferature so much as by absence of the longitudinal projection of the first type, or the lateral projection of the second, and by a general symmetry of the whole configuration. The length of the S., which to a great degree corresponds to the degree of development of the posterior cerebral lobes, has been taken by Retzius as a basis of classification. He arranges all the varieties of mankind into two great classes—the *Dolicocephalæ*, or *long-heads*, whose cerebral lobes completely cover the cerebellum; and the *Brachycephalæ*, or *short-heads*, in whom the cerebral lobes do not extend so far. Each of these classes contains *orthognathous* and *prognathous* varieties. See ETHNOLOGY.

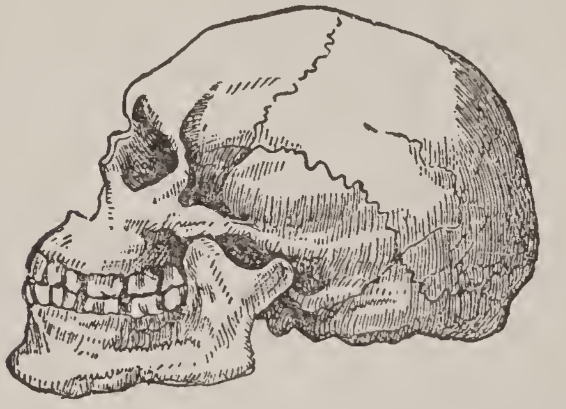


Fig. 5.—Prognathous Skull of a Native Australian.

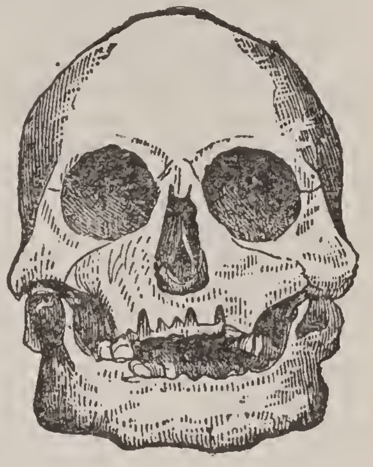


Fig. 6.—Pyramidal Skull of Mongolian Race.

The *Morphology of the Skull* is the highest and most difficult problem of comparative anatomy, and has cost extraordinary labor for its solution. Goethe and Oken independently suggested that the S. was to be regarded as the modification of a series of four vertebræ, and this 'vertebral theory' was worked out in elaborate detail by Owen and other anatomists (see OKEN). Huxley, however, in a celebrated Croonian Lecture (1858), revised and extended the hitherto neglected embryological observations of Rathke, proposed an unanswerable destructive criticism of the archetypal theory, and may be said to have thus definitely placed the newer view in the way of general acceptance. An enormous amount of detailed research, for which we are indebted chiefly to Parker in England, and Gegenbaur in Germany, and which is still in progress, has established the newer theory on sure grounds of actual observation. 'The osseous cranium,' writes Prof. St.

George Mivart, '(apart from the sense-capsules) consists of three arched segments... These have been called *cranial vertebræ*, and certainly if the essence of vertebræ consists in their being a series of solid rings, fitted together and inclosing a tract of the nervous centres, then it must be admitted that the cranium—in the highest class of animals at least—is made up of three such vertebræ.'

Taking first the simple unsegmented cartilaginous cranium of a skate or dog-fish, with its appended jaws and branchial arches, we find that in development, though the notochord extends into the region of the head, the vertebræ stop altogether short of it; but that on each side of the cranium there arise a pair of cartilaginous bars—the *trabeculæ* or 'rafters' of the future S.; three pairs of cartilaginous capsules, nasal, ocular, and auditory, form round the developing sense organs; the nasal capsules immediately unite with the ends of the trabeculæ, which are meanwhile uniting below and growing up at the sides to form the brain-case. The auditory capsules become united with the trabeculæ by the appearance of two new masses of cartilage—the parachordals—the eyes of course remaining free. At first there are no jaws, but a series of seven or more similar vertical cartilaginous bars or arches, considerably resembling the trabeculæ, between which slits open into the pharyngeal cavity. The first pair of these arches develops an ascending process, which passes above the developing mouth, and becomes the 'palato-pterygoid' arch or upper jaw, the original portion remaining as the mandible. The second pair of arches—the 'hyoid'—becomes more or less modified usually to aid in supporting the jaws and floor of the mouth, while the remaining pairs become little modified, and serve throughout life to support the gills.

The more complex bony skulls of higher vertebrates are now in principle readily understood. The chondro-cranium and subjacent arches in all cases develop in the same way, though reduction and even atrophy of the gill arches subsequently takes place. The bones, though similar in the adult, originate in two utterly distinct ways, either by actual ossifications in the substance of the chondro-cranium and jaws, or by the ossification of overlying dermis; and are hence known as cartilage bones and membrane bones respectively—the latter corresponding to the dermal bones and teeth of ganoid and elasmobranch fishes. In mammals, a further extraordinary specialization takes place: the ends of the mandibular and hyoid arches lose their suspensory function, are taken up during development into the interior of the ear capsule, and are metamorphosed into the auditory ossicles: see SKELETON.

Fracture of the Skull may take place either in the vault or at the base of the skull. We consider first *fractures of the vault.* The fracture is usually direct, the bone giving way at the point at which it was struck; the result being either a simple fissure, or a breaking of the bone into several fragments (comminuted fracture). Although fractures may be limited to the outer or to the inner surface of the

S., they usually extend through the whole thickness, and the broken bone is generally driven inward; and the most ordinary form of fracture with depression is that in which several fragments of somewhat triangular shape have their points driven down and wedged into each other, while their bases remain on a level with the surrounding bone. There are no signs by which we can in all cases recognize the existence of fracture of the vault. Fissures constantly exist without ever having been suspected during life. When, however, the fracture is accompanied by a wound leading down to the bone, it may, in general, be easily detected. In treatment, it is now an established rule that simple fractures of the S. with depression, and without symptoms, are to be left without operative interference. The depression may be so marked as to be easily detected; yet so long as there are no symptoms, all operative interference, of whatsoever form, is carefully to be avoided. If, however, there be a wound leading down to the bone in a depressed fracture without symptoms, immediate operative interference is called for. When a depressed fracture is accompanied by primary brain-symptoms, an operation for the purpose of raising or removing the depressed fragments is usually necessary. If, however, the fracture is a simple one, and the symptoms are not urgent, milder remedial agents, as bleeding, purging, and low diet, may be first tried.

Fractures of the base may be direct or indirect, but in most cases are indirect—i.e., the bones give way at a point remote from the seat of the blow, as above shown. At certain parts, however, the bones of the base are so thin that, if direct pressure be brought on them, they readily give way. Thus scissors, slate-pencils, tobacco-pipes, etc., have often been thrust into the skull through the orbits or the nostrils; and such wounds are very serious, from the readiness with which the brain may be thus injured. The only symptoms that can be trusted as indicating a fracture of the base of the S. are connected either with an escape of the substance of the brain or blood or watery fluid, or with an injury done to the nerves as they emerge at the base. Out of 32 cases of fractured base observed by Hewett, bleeding from the mouth or nose occurred in 14, and bleeding from the ear in 15 cases.

SKULL'CAP (*Scutellaria*): genus of plants, of family *Labiatæ*, or Mint family. The calyx, closed in fruit, has a helmet-like appendage on the upper side; the blue or violet corolla is a long curved tube, the upper lip arched, entire or barely notched, and the lower pair of stamens are one-celled. Of the species with terminal flowers, the narrow, toothless-leaved *S. integrifolia*, with corolla 1 in. long, is found from Mass. southward; *S. pilosa*, with crenate leaves and shorter flowers, in open ground from N. Y. and Mich. southward. *S. versicolor*, with slender tube, whitish below, and above deep blue, purple-spotted; *S. canescens*, having many-flowered racemes, and the leaves with hoary down beneath; and *S. serrata*, with serrate leaves acuminate at both ends, are southern and western.

Of the species with flowers axillary, and of wider range, are *S. nervosa*, the leaf-veins prominent beneath; *S. parvula*, 3–6 in. high; and *S. galericulata*, with lower lip longer than the upper. *S. laterifolia*, often with both axillary flowers and terminal one-sided racemes, is common in wet, shaded places; and, as a supposed cure, was called Mad-dog Skullcap. They all are bitter perennial herbs, of no medicinal virtue.

SKUNK, n. *skŭngk* [N. Amer. *seganku*]: American animal allied to the weasel, which has the power of ejecting an intolerably fetid liquid. SKUNK'ISH, a. *-ĭsh*, resembling the skunk, especially in its odor.—*Skunk* (*Mephitis*) is the name of a genus of quadrupeds of the Weasel family (*Mustelidæ*), but departing considerably from the typical characters of that family, and approaching the badgers and gluttons in general appearance, in habits, in the lengthened claws of the fore-feet, in the plantigrade hind-feet, and in some of the teeth. There are six incisors and two canine teeth in each jaw, eight molars in the upper, and ten in the lower; the teeth generally resemble those of the polecat. Skunks depend much for defense against enemies on an excessively fetid fluid, secreted by glands near the anus; and when assailed, they turn the rump toward the assailant, elevate the tail, and discharge this fluid with considerable force. The odor proceeding from it, even when a dead S. had been flung into an inclosure, has been known to cause nausea to the inmates of an apartment with closed windows at the distance of 100 yards. So confident does the S. seem of the efficacy of its peculiar mode of defense, that it permits itself to be approached till it is just on the point of being seized—which, however, is attempted only by the inexperienced—when the battery is discharged. It is almost impossible to remove the odor from clothes. Dogs flee at once, and rub their noses on the ground till they bleed: dogs that are aware of the S.'s powers, however, kill it by leaping upon it suddenly in such a way that they are not exposed to its peculiar assault. There is much uncertainty concerning the species of S., as the colors vary considerably even in the same species; but there is no doubt of the existence of a number of species. They are found only in America, where they are very

Common Skunk (*Mephitis mephitica*).

widely distributed from Hudson's Bay to the Strait of Magellan. The COMMON S. (*M mephitica*) is about the size of a cat, generally black or blackish brown, with the white of the crown diverging into two white streaks. It inhabits burrows which it makes in the earth; feeds on mice, frogs, etc., and also on insects and fruits; and sometimes enters houses to plunder store-rooms, where, if it is suddenly alarmed, everything is tainted with an intolerable odor. White streaks on the back, one or more, are very characteristic of this genus.

Conepatus mapurito, black with a broad white band on the back, belongs to the s.w. United States. The small *Spilogale putorius* has been tamed at the south, to serve against vermin, instead of a cat. It was found as far n. as Iowa by H. W. Parker, and two skins sent by him are pictured in Coues's *Fur-bearing Animals.* The interrupted white markings on the back and sides resemble a harp.

SKUNK CABBAGE (*Symplocarpus fœtidus*—Gr. *sumploke*, complex; *karpos*, fruit): plant of the Arum family *Araceæ*, nearly related to the Indian Turnip and Calla and well named as to its odor. The fleshy spike (spadix) of minute flowers is globular; and the hood (spathe) is incurved, shell-shaped, very thick, purple, or spotted and striped with purple and yellow or green, and withers as the fruit matures—a spongy mass with seeds beneath the surface. The first flowers appear very early in spring, rising little above the ground; later, the large heart-shaped leaves, 1–2 ft. long. The leaves have been used in medicine as dressing to prolong blistering and suppuration. The thick root-stock has been employed as an expectorant and stimulant, having some virtue when fresh. The purplish seeds, dropped from the decaying spadix, are bulblet-like, ⅓ to ½ in. in diameter. The plant is common in moist ground.

SKUPSHTINA, *skôpsh'tĭn-â* [Serb]: the legislative body of the kingdom of Servia. It consists of 178 members chosen for 3 years. Of the members, three-fourths are elected by the people, the rest are named by the crown. The word S. in Serb means assembly, meeting, in general; the full designation of the Servian legislative assembly is 'Narodna Skupshtina.'

SKURRY, n. *skŭr'rĭ* [OE. *scur*, to move hastily: Gael. *sgiorr*, to slide or stumble: Dan. *skurre*, to jar]: confused haste, used in the familiar phrase HURRY-SKURRY, n. *hŭr'rĭ-skŭr'rĭ*, impetuous haste.

SKY, n. *skī* [Sw. and Dan. *sky*, a cloud: Sw. *skyn*, the sky or heaven: Icel. *sky*, a cloud: connected with AS. *scuwa;* Dut. *schæde;* Gr. *skia*, shadow, shade—*lit.*, a cloud, then the clouds]: the region of clouds which surrounds the earth; the vault of the heavens; the firmament; climate: plu. SKIES, *skīz:* V. *familiarly*, to hang very high, said of a picture in an exhibition. SKY'ING, imp. SKYED, pp. *skīd:* ADJ. surrounded by skies. SKYEY, a. *skī'ĭ*, resembling the sky; ethereal. SKY'ISH, a. *-ĭsh*, like the sky; in *OE.*, approaching the sky. SKY-BLUE, azure. SKY-COLOR, a particular kind of blue color; azure. **Sky-high**, a. very high. **Skylark**, a bird that mounts and sings as it flies. **Skylarking**, among *seamen*, running sportively among the rigging; in *familiar language*, running and larking about any place; rough jocular play. **Sky-light**, a window in the roof of a building. **Sky-rocket**, *-rŏk'ĕt*, a rocket that burns as it ascends. **Sky-sail**, a sail sometimes set above the royal. **Sky-scraper**, a sky-sail of a triangular form. **Skyward**, ad. toward the sky. **Open sky**, a sky without clouds; with no covering or shelter from the sky.

SKYE, *skī:* largest of the Scottish islands after Lewis, and most northerly of the Inner Hebrides; forming part of the county of Inverness, from whose mainland it is separated by a channel scarcely half a mile in breadth at its narrowest point, Kyle Rhea. Its extreme length, s.e. to n.w., is 47 m.; breadth 7 to 25 m.; 643 sq. m.; but on account of the extraordinary number of inlets at all parts of the island, no point is more than 4 m. from the sea. S. is mostly mountainous and moory, but it contains some pleasant tracts of arable and pasture land, and one considerable plain, formerly the bed of a lake, in the parish of Kilmuir, where some ruins of a religious house called after St. Columba were found. The principal mountains are the Coolin Hills (not Cuchullin), which stretch irregularly chiefly from s.w. to n.e., terminating in the sharp peak of Scoor-nan-Gillean (3,167 ft.) above Sligachan: another peak, Scoor Dearg, has been found to be the highest of the range (3,233 ft.). The jagged outline of these remarkable hills arrests the eye at a great distance, and forms the dominant feature in the view at almost every point round the island, and far out at sea. The rock of which they are composed, hypersthene, is not found in any other part of Britain. The most famous scene in this region is Loch Coiruisg, a small lake near the head of the Bay of Scavaig, nearly encircled by frowning ridges of rock, rising at some points above 3,000 ft. It has been powerfully depicted by Sir W. Scott in *The Lord of the Isles*. Glen Sligachan, extending from the head of the loch of that name about 9 m. to Camusunary, is by many considered the grandest glen in the Highlands. The scenery of Cuiraing, near the n. of the island, has been truly styled 'unique.' The same is said of Storr. The coast-scenery is mostly highly picturesque. Between Rhunam-Brarin and Loch Staffin, on the e. side, it presents grand columnar trap formations. On the w. side, at Galtrigill and Vaterstein, the cliffs reach a height of 1,000 ft. Over these cliffs descend many remarkable water-falls, and their bases are worn into many deep caves, some of which are of historical interest. One, near Portree, afforded a refuge to Prince Charles; another, on the w. coast, was the temporary prison of Lady Grange. The largest arms of the sea are Loch Bracadale, Loch Dunvegan, and Loch Snizort.

The coasts abound in fish, the most important being herring, salmon, cod, and ling. Good oysters are found in several places. The fisheries comprise cod, ling, salmon, and lobster; and salmon and sea-trout are got in some of the principal streams, also trout in the fresh-water lochs. Deer are not numerous, nor are grouse. West Highland cattle are reared, but sheep-farming on a large scale predominates. The climate is exceedingly rainy, but mild and healthful. Agriculture is not profitable in the moist climate, though the soil is in many places excellent.

The inhabitants are mostly poor and ill housed, but well behaved and intelligent. It has been calculated that during the long war with France they contributed not less than 10,000 private soldiers to the Brit. army. In some districts nearly all the men go to the e. coast fisheries in summer, and from all parts of the island young men and women go to the south in search of field-labor. Potatoes and fish are the general diet, meat being a rare luxury. The population is chiefly Celtic, with considerable mixture of the Norse element Gaelic is still generally spoken, but is gradually giving place to English. The chief proprietors are still, as of old, Lord Macdonald, whose seat, Armadale Castle in Sleat, is one of the most beautiful, in all its surroundings, on the Scottish coasts; and Macleod of Macleod, whose ancient castle of Dunvegan, picturesquely seated on a rock, has been commemorated by Dr. Johnson and Sir Walter Scott. The principal port of S. is Portree, a picturesquely situated village (pop. [1881] 758), to which steamers regularly ply from Glasgow, also from Strome Ferry in connection with the Skye railway thence to Inverness. The famous whisky known as 'Tallisker' is made at the head of Loch Bracadale.—The inhabitants are nearly all Presbyterians, chiefly of the Free Church.—Pop. (1871) 17,330; (1891) 15,800.

See Alexander Smith's *Summer in Skye* (1865); Robert Buchanan's *Hebrid Isles* (1883); *Report of the Crofters' Commission* (1884).

SLAB, n. *slăb* [W. *llab*, a flag or thin strip—probably in the sense of a piece separated from the mass: Lang. *esclapa*, to split wood: comp. Norw. *sleip*, smooth]: a flat piece of marble or other stone; a flat mass of metal; the thick outside plank of a log of timber.

SLAB, a. *slăb* [see SLABBER]: in *OE.*, thick, glutinous; viscous: N. a puddle; mire. SLAB'BY, a. *-bĭ*, thick; viscous; sloppy.

SLABBER, v. *slăb'bėr* [Ger. *schlabbern*, to slabber one's clothes: Swiss, *schlabbete*, watery drink, broth: Dut. *slabberen*, to slobber: comp. Gael. *slaib*, mire]: to spill liquid food in eating; to slaver; to drivel: N. slaver. SLAB'BERING, imp. SLAB'BERED, pp. *-bėrd.* SLAB'BERER, n. *-bėr-ėr*, one who slabbers; an imbecile; an idiot.

SLABBER, n. *slăb'ėr:* in *metal-working*, a quick-motion machine for dressing the sides of nuts or heads of bolts; in *wood-working*, a saw for removing a portion from the outside of a log, so as to square it.

SLACK, a. *slăk* [Icel. *slakr;* prov. Ger. *schlack;* Sw. and Dan. *slak*, not tight, loose: AS. *sleac*, slack]: loose; relaxed; not tightly extended; backward; not busy, as applied to business men; not using due diligence: V., see SLACKEN: N. the part of a rope which has no strain upon it; a kind of small broken coal; in *Scot.* and *prov. Eng.*, a gap or hollow between hills: AD. partially; not intensely. SLACK'LY, ad. *-lĭ*, not tightly; loosely; remissly. SLACK'NESS, n *-nĕs*, looseness; inattention; slowness; dulness, as in trade; tardiness; insufficiency. SLACK-BAKED, insufficiently baked, as bread. SLACK-DRIED, partially or insufficiently dried. SLACK-ROPE. a rope having no strain upon it. SLACK-WATER, the interval between the ebb and flow of the tide, during which there is no tide-current. SLACKEN, v. *slăk'n*, or SLACK, v. *slăk*, to loosen; to relax; to become less rigid; to make less tense or tight; to abate; to cease to flow, as the tide; to languish; to diminish in severity; to neglect; to lessen, as one's pace; to deprive of the power of cohesion, as burnt limeshell—properly SLAKE, which see. SLACKEN, n. in *metallurgy*, spongy, slaggy materials mixed with ores to prevent their fusion while roasting: also spelled SLAKIN. SLACKENING, imp. *slăk'nĭng.* SLACKENED, pp. *slăk'nd:* also SLACK'ING, imp. SLACKED, pp. *slăkt.*—SYN. of 'slack, a.': remiss; backward; loose; relaxed; weak; neglectful; unbent; inactive; slow; tardy.

SLADE, n. *slād* [AS. *slæd*]: little dell or valley; a glade; a flat piece of low moist ground.

SLAE, n. *slā:* Scotch for SLOE, which see.

SLAG, n. *slăg* [Ger. *schlacke;* Sw. *slagg*, dross of metals: Norw. *slagg*, spittle]: dross or refuse from metallic ores after being smelted; vitrified cinders. SLAG'GY, a. *-gĭ*, pert. to or resembling slag. SLAG'GINESS, n. *-gĭ-nĕs*, the state of smelted dross or refuse from a smelting-furnace.—*Slag* is a fused compound of silica and lime, alumina, and other bases; a secondary product in the reduction of metallic ores: called also Scoria (or Scoriæ) and Cinder—when discharged from a volcano. More or less of the metal always remains in a slag; in the early days of iron-smelting, the proportion of metal thus wasted was so great that some old slags have been profitably smelted in recent times. Slags, being silicates, are of the nature of glass, and externally have a glassy, crystallized, or stone-like character. Beautifully crystallized specimens are occasionally seen at smelting-works. They vary much in color and are sometimes so prettily veined and marbled that attempts have been made to apply them to ornamental purposes. Millions of tons of slag are annually produced at iron-smelting works. One mode of utilizing the material is by casting it in square blocks or bricks for building purposes. The S. is run into molds, either as it issues from the blast-furnace, or after being remelted; and it is found very durable. Broken S. is used also as a covering for roads, but its brittleness and sharpness are objectionable. 'Mineral cotton' is produced by allowing a jet of steam to escape through a stream of liquid S., by which it is blown into fine white threads, sometimes 2–3 ft. long. These threads break into shorter ones, and the appearance of the substance is that of a mass of cotton-fibre. Being a poor conductor of heat, the long fibre is used in weaving a covering for boilers and steam-pipes. The short fibre (' mineral wool ') is used for a deadening in floors of buildings.

In an archæological view, S. is interesting as pointing out the sites of ancient smelting-works, and as affording a clew to the primitive methods of obtaining the metals from their ores.

SLAIN, v. *slān:* pp. of the verb SLAY, which see.

SLAKE, v. *slāk* [see SLACK: Icel. *slakr*, not tight: Sw. *släcka*, to quench: Low Ger. *slakkern*, to be sloppy, to rain continuously; *slikk*, mud, ooze]: to quench, as thirst; to abate; to become extinct; to add water to, as lime, for the purpose of creating a chemical combination. SLA'KING, imp. SLAKED, pp. *slākt:* ADJ. mixed or besprinkled with water so as to be reduced to powder, as burnt limestone. SLAKED LIME, lime reduced to powder by water thrown upon it; hydrate of lime.

SLAM, v. *slăm* [Norw. *slemba*, to smack, to bang: Sw. *slamra*, to jingle, to clatter]: to strike with force and noise; to shut with violence; to win all the tricks at cards: N. a stroke with much noise; the violent shutting of a door; the refuse from alum-works. SLAM'MING, imp. SLAMMED, pp. *slămd.* SLAM-BANG, or SLAP-BANG, *familiarly*, with great violence.

SLANDER, n. *slăn'dėr* [OE. *sclaundre;* F. *esclandre*, scandal, discredit—from L. *scandălum;* Gr. *skan'dalon*, cause of offense, a snare]: false tale or report or defamatory words, tending to injure the reputation of another; defamation: in *OE.*, disgrace; reproach; ill name: V. to injure by maliciously spreading a false report; to defame. SLAN'DERING, imp.: ADJ. defaming; belying. SLAN'DERED, pp. *-dėrd.* SLAN'DERER, n. *-dėr-ėr*, one who slanders. SLAN'DEROUS, a. *-ŭs*, that utters or contains defamatory words; calumnious: in *OE.*, scandalous; shameful. SLAN'DEROUSLY, ad. *-lĭ.* SLAN'DEROUSNESS, n. *-nĕs*, state or quality of being defamatory.—SYN. of 'slander, v.': to asperse; calumniate; vilify; defame; reproach; scandalize. —*Slander* is in general whatever imputes an offense punishable by the criminal courts, or disgraceful, fraudulent, or dishonest conduct; or even tends to make a man contemptible in his private relations and shunned by his friends and neighbors. Thus, whatever imputes a contagious or an infamous disease is a S. Words imputing gross ignorance or misconduct affecting one's trade or profession are actionable, as calling a man a bankrupt grocer, a quack doctor, etc. To be slanderous, the words spoken must be false. The words must have been uttered with regard to the complainant: thus, a mother has no action for S. against one who calls her child a bastard. The remedy for S. is an action at law for damages: see LIBEL.

SLANG, v. *slăng:* pt. of SLING, which see.

SLANG, n. *slăng* [Norw. *slengja,* to fling, to cast; *slengjeord,* a slang word, an insulting allusion]: term applied to those familiar and pithy words and phrases, both coarse and refined, which have their origin by accident or caprice, are in use by persons in every grade of life, and which float about and change with fashion and taste, but not without leaving in some cases permanent and recognized additions to the language: low, vulgar language. SLANGY, or SLANGEY, a. *slăng ĭ,* characterized by slang words; abounding in slang; like slang.—*Slang* denotes a burlesque style of conversational language, originally found only among the vulgar, but now more or less in use among persons of some cultivation. It is somewhat allied to, though distinct from, *cant* (in French, *argot*), the language used for purposes of concealment by thieves and vagrants of all descriptions.

S. was known in the classic ages of Greece and Rome, and abounds in the writings of Aristophanes, Plautus, Terence, and Martial. Every modern European language has its S. In England, the 'Rump,' the 'Barebones Parliament,' the terms 'Roundheads,' 'Puritans,' 'Quakers,' all belonged to the S. of the 17th c.; so, too, the political terms 'slate,' 'wire-pulling,' 'pipe-laying,' 'filibustering,' 'dough-face,' belong to the vocabulary of S. *Hudibras* and the dramatic works of the 18th c. abound in S. Old English S. was coarser than that now in use, but the greater portion of its phraseology had a somewhat restricted circulation, not permeating every species of conversation to the extent that modern S. does. Toward the close of the 18th c., the S. vocabulary received large additions from pugilism, racing, and 'fast life;' and its fashionable vulgarisms came into great favor during the minority of the prince regent. In the 19th c. the growth of refinement in manners and ideas has not banished S., but given it a more familiar and utilitarian character, while it has been introduced to some extent into circles where it was formerly unknown.

S. consists in part of new words, in part of words of the legitimate language invested with new meanings, such as are assigned to the verbs to *cut,* to *do.* Many S. expressions are derived from thieves' cant, and some from the gypsy tongue. Their derivations are often indirect, arising out of fanciful allusions and metaphors, which soon pass out of the public mind, the word remaining, while its origin is forgotten. The origin of much current S. may be traced to the comic stage and to popular novels.

There is a S. attached to various professions, occupations, and classes of society. The S. of fashionable life and fashionable novels comprises a number of French words and phrases, whose application is often very different from that current in France. The *beau monde,* a *chaperon,* a marriage being on the *tapis,* are expressions which, in their English sense, are utterly unknown in Paris. The stock exchange has made large contribution to the S. vocabulary, e.g., 'bull,' 'bear,' 'long,' 'short,' 'lambs,' etc.; equally large is the contribution of the prize-ring, e.g., 'knock-out,' 'in chancery,' 'striking below the belt,' 'throw up the sponge,' etc. We have also college and university S., religious S., literary S., civic S., etc.

SLANT, a. *slănt* [Low Ger. *slindern,* to slide: W. *ysglentio;* Sw. *slinta,* to slide, to slip]: sloping; oblique; inclined from a direct line: N. an inclined plane: V. to turn from a direct line; to give a sloping direction to; to incline. Slant'ing, imp.: Adj. inclining from a right line; having an oblique direction. Slant'ed, pp. Slant'ingly, ad. *-lĭ.* Slant'wise, ad. *-wīz.* Slant'ly, ad. *-lĭ,* obliquely; in an inclined or slanting direction.

SLAP, n. *slăp* [Low Ger. *slapp,* a box on the ears: Dan. *slap;* Ger. *schlapp,* slack, loose: Ger. *schlappen;* Low Ger. *slabben,* to lap or suck up with a noise: an imitative word]: a blow given with the open hand, or with anything broad and flat: V. to strike with the open hand, or with a broad flat thing; to smack: Ad. with a sudden violent blow. Slap'ping, imp: Adj. *familiarly,* rapid, as a *slapping* pace. Slapped, pp. *slăpt.* Slap-dash, ad. all at once; in an offhand manner; with wild aim; precipitately. Slap-jack, a kind of pancake. Slapper, a. *slăp'pėr, familiarly,* very large; of great size. Slap-bang, ad. violently. Slap up, in *slang,* dashing or very exquisite; first-rate.

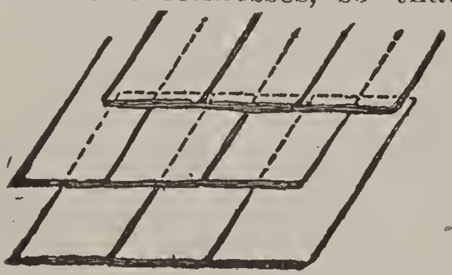
SLASH, v. *slăsh* [a word imitative of a blow like a dash among a liquid: Dan. *slaske,* to dabble: Sw. *slaska,* to be sloppy: comp. Gael. *slais,* a lash]: to cut by striking violently at random; to strike at random with a sword or other edged instrument; to slit; to crack, as a whip: N. a cut made at random with a sword, or knife, or whip; a long cut. Slash'ing, imp.: Adj. cutting at random; cutting up; sarcastic, as a *slashing* review. Slashed, pp. *slăsht:* Adj. having long narrow openings, as a sleeve, etc., to show a brighter-colored cloth beneath; in *bot.,* deeply gashed; divided by deep and very acute incisions.

SLATCH, n. *slăch* [from Slack, which see]: among *seamen,* the middle or slack part of a rope; an interval of fair weather.

SLATE, n. *slāt* [OE. *sclat,* stone used for roofing: OF. *esclat,* a splinter; *esclater,* to crack: AS. *slitan;* Icel. *slita,* to rend: Scot. *sklate;* Gael. *sgleat,* a slate]: any rock that can be split into thin laminæ or plates; argillaceous rocks whose lamination is produced by cleavage; a thin plate of stone for roofing, or for writing on: *foliated rocks,* like gneiss and mica-schist, are termed *schists* and not *slates;* thinly bedded sandstones are called *flagstones* or *tilestones:* Adj. made or consisting of slate: V. to cover or roof with slates; to criticise severely, as to *slate* a book. Sla'ting, imp.: N. the cover of slates put on a roof; materials for covering a roof. Sla'ted, pp. Sla'ter, n. *-tĕr,* one whose occupation is to cover roofs with slates, etc. Sla'ty, a. *-tĭ,* resembling slate; having the cleavable structure of clay-slate. Sla'tiness, n. *-tĭ-nĕs,* the state or quality of being slaty. Slate coal, a hard coal that can readily be split into pieces. Slate-gray, blue, with a large admixture of gray. Slate-pencil, a pencil of soft slate for writing on slates—either a cut or turned stick of soft slate or like material, or made by pressing moistened slate powder into a firm dry stick. SLATE-SPAR, calcareous spar—so called from its occurring in thin slaty laminæ. A SLATE LOOSE, not quite sound in mind.—*Slate* or *Clay-slate* is a highly metamorphosed argillaceous rock, fine-grained and fissile, and of dull blue, gray, green, or black color. It splits into thin laminæ or plates, altogether independent of the layers of deposit; though sometimes coinciding with them, they more frequently cross them at different angles: see CLEAVAGE. A good example may be seen from the cars on the Lehigh Valley r.r., at Slatington, Penn., where the slates are transverse to the bedding. The theory accepted is that the lateral pressure which acted from the sea inland, ridging the crust, produced the lamination. The same effect on a mass of clay under hydraulic pressure was produced by Prof. Tyndall. Thus, nature has made slates ready-cut, and set up like thin volumes in a library. Some rocks that split into the thin plates of the original stratification are popularly but erroneously named S., as the thin bedded sandstones properly called flagstones or tilestones, the fissile shales of Cambrian and Silurian age, and the metamorphic, gneiss, and mica schist, whose planes of division correspond to their stratification.

True S. is a very compact rock, little liable to be acted on by atmospheric agencies. It is obtained chiefly from Paleozoic strata, but is found also among more recent rocks It is used for various purposes, being split into thin slabs of small size for roofing of houses, and into larger slabs for fitting up dairies, etc., and even for making billiard-tables; and it is split and polished by means of pumice for writing-slates. There are extensive quarries of roofing-slate in the United States and Canada, in the British Isles, in France, Belgium, Sweden, Norway, Germany, Austria, and Italy. The S. product of the United States (1889) amounted in value to $3,444,863. Penn. produced $2,011,776 worth, Vt. $838,013, Me. $214,000. A hard compact S. is best for roofing; that which is porous imbibes water, the freezing of which splits it in winter, while it affords also a soil for mosses, which soon injure the roof.

In roofing with slates, it is necessary to put on the slates in two thicknesses, so that the sloping joints may be covered by the overlap of the course above. Besides this, the third course must also cover the first by an inch or two, to prevent rain from penetrating. Slates are generally laid upon boarding, and nailed with malleable-iron nails, japanned to prevent them from rusting.



SLATER, *slā'tėr*, JOHN FOX: 1815, Mar. 4—1884, May 7; b. Slatersville, R. I.; nephew of Samuel S. He became a resident of Norwich, Conn., extended his father's cotton-manufacturing business, and gained a large fortune by profitable investments. He gave of his wealth liberally for educational work, aiding largely in the founding of the Norwich Free Acad.; and 1882 he established the 'Slater Fund' of $1,000,000, the income to be used for education of the colored people of the south. He d. at Norwich.

SLA'TER, SAMUEL: 1768, June 9—1835, Apr. 21; b. Belper, Derbyshire, England: introducer of the Arkwright cotton-machinery into the United States. He was apprentice of a partner of Arkwright, and came to this country 1789, attracted by a bounty offered by Pennsylvania. Cotton-machinery had been in use in Beverly, Mass., and elsewhere; but Arkwright's invention of spinning by rollers was a great advance (see COTTON). No model or plans of it could be brought; and, encouraged by Moses Brown of Providence, S. went to Pawtucket, R. I., and reproduced the new spinner entirely from memory, 1790, together with other machinery invented in the previous decade; beginning the manufacture that year, with a product as good as that of British mills. In 1806 he and his brother, John S., founded the works in Slatersville, R. I.; in 1812 those at Webster (formerly Oxford), Mass.: there also he began manufacture of woolen fabric. He became very rich by these enterprises, and others in iron-mills, etc. In 1796 he opened, for his operatives, one of the first Sunday schools in this country. He died in Webster. His life was published by George S. White (1836).

SLATTERN, n. *slăt'tėrn* [Ger. *schlottern*, to hang flapping about one, as clothes: Dut. *slodderen*, to hang and flap: Swiss, *schlodig*, negligent in dress: Bav. *schlütt*, a dirty person]: a woman negligent of her dress: one who is not neat or nice. SLAT'TERNLY, a. *-lĭ*, not clean; slovenly; untidy: AD. negligently.

SLAUGHTER, n. *slaw'tėr* [Icel. *slá*, to strike; *slatr*, butcher's meat: Dan. *slaae;* Ger. *schlagen*, to strike (see SLAY)]: great destruction of life by violence; carnage; butchery; a killing of oxen, sheep, etc., for human food: V. to make great destruction of life by violence; to massacre; to kill beasts for the market. SLAUGH'TERING, imp. SLAUGH'TERED, pp. *-tėrd*. SLAUGH'TERER, n. *-tėr-ėr*, one who slaughters. SLAUGH'TEROUS, a. *-ŭs*, murderous; destructive. SLAUGH'TEROUSLY, ad. *-lĭ*. SLAUGHTER-HOUSES, erections where beasts are killed for market. SLAUGHTERMAN, one employed to kill beasts for human food.—SYN. of 'slaughter, n.': massacre; butchery; murder; havoc; carnage.

SLAV, or Slave, *slâv*, or Sclav, or Sclave, n. *sklâv* [Russ. *slava*, glory, i e., the glorious race (but see Slavs), a people of e. Europe, from whom the anc. Germans drew many of their *slaves;* now comprising the Russians, Bulgarians, Illyrians, Poles, Bohemians, etc.]: native of Slavonia; more widely, one of the people called Slavs (q.v.); also the language. Slavonian, a. *slă-vō′nĭ-ăn*, or Slavon′ic, a. *-vŏn-ĭk*, pertaining to Slavonia, its people, or its language: spelled also Sclavonian, Sclavonic.

SLAVE, n. *slāv* [F. *esclave;* Ger. *sclave*, a slave; a term taken from *Sclave*, a member of the Sclavonian race, a common source for slaves in early times: Russ. *slava*, fame, glory (see Slav: Slavs)]: any one held as a bond-servant for life; a human being wholly the property of another: a Serf (q.v.); a drudge: one who surrenders himself wholly to any power, as to an appetite, or to the influence of another: V. to drudge; to toil unremittingly. Sla′ving, imp. Slaved, pp. *slāvd.* Slaver, n. *slā′vėr*, a ship fitted for carrying slaves. Sla′very, n. *-ĭ*, the state of being absolutely the property of another for life; bondage for life; exhausting and mean labor; drudgery; captivity (see below). Sla′vish, a. *-vĭsh*, pertaining to slaves; mean; servile; meanly laborious. Sla′vishly, ad. *-lĭ*. Sla′vishness, n. *-nĕs*, the state or quality of being slavish. Slave-born, born in a state of slavery. Slave-catcher, one whose occupation is to pursue and capture runaway slaves. Slave-catching, the business of a slave-catcher. Slave Coast, part of the coast of Upper Guinea, on the w. coast of Africa between the rivers Volta and Lagos, from which slaves were carried (see Guinea). Slave-coffle, *-kŏf′fl* [Ar. *kafala*, a caravan]: a band of slaves to be sold. Slave-driver, one who superintendents slaves when at work. Slave-holder or -owner, one who possesses slaves. Slave-hunt, hostile incursion for capture of persons to make slaves of them; search after fugitive slaves. Slave-ship, ship employed in carrying slaves. Slave-trade, traffic in slaves; the purchasing or kidnapping human beings for slaves, particularly on the coast of Africa, in order to carry them to distant countries.—Syn. of ‘slave, n.’: bond-man or -woman; bond-servant; drudge; dependent; serf; captive; vassal; henchman.

SLAVER, n. *slăv′ėr* [a variation of Slabber: Icel. *slafra*, to lick: Norw. *sleve*, slaver or drivel: L. *salīva*, spittle]: saliva drivelling from the mouth: drivel: V. to emit spittle; to smear or foul with saliva issuing from the mouth; to be smeared with spittle. Slav′ering, imp. Slav′ered, pp. *-ėrd.* Slav′erer, n. *-ėr-ėr*, a driveller; an idiot.

SLAVERY, *slāv′ėr-ĭ:* condition of a person who is the property, or at the disposal of another who has the power and claims the right to employ or treat him as he pleases. Such is the state of the slave in the absolute sense; but S. has been subjected to innumerable limitations and modifications.

S. arose probably at an early period of the world's history out of the accident of capture in war. Savages, instead of massacring their captives, found it more profitable to keep them in servitude. All the ancient oriental nations of whom we have any records, including the Jews, had their slaves. The Hebrews were authorized by their law to possess slaves, not only of other races, but even of their own nation, though the latter were generally insolvent debtors, who had sold themselves through poverty, or thieves who lacked the means of making restitution; and the law dealt with these far more leniently than with stranger slaves. They might be redeemed; and if not redeemed, became free at the end of seven years from the beginning of their servitude; besides which, the law provided, every 50th year, a general emancipation of native slaves.

S. existed in ancient Greece; in the Homeric poems, it is the ordinary destiny of prisoners of war; and the practice of kidnapping slaves is also recognized—Ulysses himself narrowly escaping this fate. None of the Greek philosophers considered the condition of S. objectionable on the score of morals. Aristotle defends its justice on the ground of a diversity of race, dividing mankind into the free and the slaves by nature; while Plato desires only that no Greeks be made slaves. One class of Greek slaves were descendants of an earlier and conquered race of inhabitants, who cultivated the land which their masters had appropriated, paid rent for it, and attended their masters in war. Such were the Helots in Sparta, the Penestæ in Thessaly, the Bithynians at Byzantium, etc., who were more favorably dealt with than other slaves, their condition somewhat resembling that of the serfs of the middle ages. They could not be sold out of the country, or separated from their families, and were even capable of acquiring property. Domestic slaves obtained by purchase were the unrestricted property of their owners, who could dispose of them at pleasure. In Athens, Corinth, and the other commercial states, they were very numerous and mostly barbarians. They were employed partly in domestic service, but more as bakers, cooks, tailors, or in other trades, and in mines and manufactories; and their labor was the means by which the owner obtained profit for his outlay in their purchase. These slaves were mostly purchased; but few were born in their master's family, partly from the general discouragement of the cohabitation of slaves, partly from the small number of the female in comparison with the male slaves. An extensive slave traffic was carried on by the Greek colonists in Asia Minor with the interior of Asia; and another source of supply was the practice common among Thracian parents of selling their children. In Greece in general, especially at Athens, slaves were mildly treated, and had a large share of legal protection. According to Demosthenes, a slave at Athens was in better condition than a free citizen in many other countries.

The Roman condition of S. differed in some particulars from that of Greece. All men were considered by the Roman jurists to be free by natural law; while S. was regarded as a state contrary to natural law, but agreeable to the law of nations, when a captive was preserved, instead of being slain; or agreeable to the civil law, when a free man sold himself, or a creditor held as a slave his insolvent debtor. In earlier times there was no restriction on the master's power of punishing or putting to death his slave; and even at a later period when the law on this head was much modified, slaves were used with considerable rigor. The estimation in which their lives were held is illustrated by the practice of gladiatorial combats; also by the conduct of Vedius Pollio, who, in the polite age of Augustus, flung such slaves as displeased him into his fish-ponds, to feed his lampreys, and on the matter being brought under the emperor's notice, was visited with no severer punishment than the destruction of his ponds. Old and useless slaves were often exposed to starve in an island of the Tiber. Under the empire, the cruelty of masters was in some degree restrained by law. It was enacted that a man who put to death his own slave without cause should be dealt with as if the slave had been the property of another; and that if the cruelty of a master was intolerable, he might be compelled to sell the slave. A constitution of Claudius declared the killing of a slave to be murder, and it was also enacted that in sales of slaves, parents and children, brothers and sisters, should not be separated. A slave could not contract marriage, and no legal relation between him and his children was recognized. The children of a female slave followed the status of their mother. There were various ways in which a slave might be manumitted, but the power of manumission was restricted by law. The harboring of a runaway slave was illegal. The number of slaves in Rome, originally small, was increased much by war and commerce; and the cultivation of the soil came, in the course of time, to be entirely given up to them. During the later republic and empire, persons of good estate kept an immense number of slaves as personal attendants; and the possession of a numerous retinue of domestic slaves was matter of ostentation--200 being no uncommon number for one person. A multitude of slaves were also occupied in the mechanical arts and the games of the amphitheatre. Originally, a slave was incapable of acquiring property, all his acquisitions belonging to his master; but when slaves came to be employed in trade, this condition was mitigated, and it became the practice to allow a slave to consider part of his gains, called his *peculium*, as his own, a stipulation being sometimes made that he should purchase his freedom with his peculium when it amounted to a specific sum.

Though the introduction of Christianity did not immediately put an end to S., it tended to ameliorate the slave's condition. Justinian did much to promote the eventual extinction of S.; and the church excommunicated slave-owners who put their slaves to death without warrant from the judge. But the number of slaves again increased; multitudes—mostly Slavonian captives (whence our word *slave*)—being brought in by the barbarian invaders; and in the countries which had been provinces of the empire, S. continued long after the empire had fallen to pieces, and eventually merged into the mitigated condition known as serfdom, which prevailed all over Europe in the middle ages, and has been gradually abolished in modern times: see SERF. But though the practice of selling captives taken in war as slaves ceased in the Christian countries of Europe, a large slave-traffic continued among Mohammedan nations, by whom Christian captives were sold in Asia and Africa; and in the early middle ages, the Venetian merchants traded largely in slaves, whom they purchased on the coast of Slavonia, to supply the slave-markets of the Saracens.

The negro S. of modern times was a sequel to the discovery of America. Prior, however, to that event, the negroes, like other savage races, enslaved those captives in war whom they did not put to death, and a considerable trade in slaves from the coast of Guinea was carried on by the Arabs. The deportation of the Africans to the plantations and mines of the new world doubtless raised the value of the captive negro, and made S. rather than death his common fate; while it may also have tempted the petty chiefs to make war on each other, for the purpose of acquiring captives and selling them. The aborigines of America having proved too weak for the work required of them, the Portuguese, who possessed a large part of the African coast, began the importation of negroes, in which they were followed by the other colonizers of the new world. The first part of the new world in which negroes were extensively used was Hayti, in St. Domingo. The aboriginal population had at first been employed in the mines; but this sort of labor was found so fatal to their constitutions that Las Casas, Bishop of Chiapa, celebrated protector of the Indians, interceded with Charles for the substitution of African slaves as a stronger race; the emperor accordingly, 1517, authorized a large importation of negroes from the establishments of the Portuguese on the coast of Guinea. Sir John Hawkins was the first Englishman who engaged in the traffic, in which his countrymen soon largely participated, England having exported 1680–1700 no fewer than 300,000 slaves from Africa, and 1700–86 imported 610,000 into Jamaica alone. A Dutch ship brought from the Guinea coast to Jamestown, Va., a cargo of negroes 1620: this was the beginning of S. in the English colonies in America. An English company obtained (1713) the monopoly of supplying negro slaves to the Spanish colonies for 30 yrs.: the contract having been annulled by Spain 1739, England declared war on Spain. The annual exportation of slaves from Africa was as follows about 1790: By the British, 38,000, French, 20,000, Dutch, 4,000, Danes, 2,000, Portuguese, 10,000: total, 74,000. Between 1680 and 1786 2,130,000 negro slaves were imported into the Brit. colonies of America and the W. Indies. The slave-trade was attended with extreme inhumanity; the ships which transported the negroes from Africa to America were overcrowded to such extent that a large proportion died in the passage; and the treatment of the slave after his arrival in the new world depended much on the character of his master. Legal restraints were, however, imposed in the various European settlements to protect the slaves from injury; in the Brit. colonies, courts were instituted to hear their complaints; their condition was to a certain extent ameliorated, and the flogging of women was prohibited.

Before emancipation was contemplated, the efforts of the more humane portion of the public were directed toward abolition of the traffic in slaves. The Friends (or Quakers) from the beginning condemned the slave-trade; in Pennsylvania they advised their members against embarking in the trade 1696; and 1776 required all members holding slaves to emancipate them. Societies were formed among the Friends to relieve the slaves in the colonies and to discourage the slave-trade. In 1787, a society for suppression of the slave-trade was formed in London, numbering W. Dellwyn, Thomas Clarkson, and Granville Sharp among its original members. The most active parliamentary leader in the cause was William Wilberforce, whose views were seconded by Pitt. A bill introduced by Wilberforce for putting an end to the further importation of slaves was lost 1791. Meanwhile, the conquest by the English of the Dutch colonies having led to a great increase in the British slave-trade, an order in council prohibited that traffic in the conquered colonies 1805; and the next year an act was passed forbidding British subjects to take part in it, either for supply of the conquered colonies or of foreign possessions. In the same year, a resolution moved by Fox for a total abolition next session was carried in the commons, and on Lord Granville's motion, adopted in the lords; and the following year, the general abolition bill, making all slave-trade illegal after 1808, Jan. 1, was introduced by Lord Howick (afterward Earl Grey) in the house of commons, was carried in both houses, and received the royal assent 1807, Mar. 25. British subjects, however, continued to carry on the trade under cover of the Spanish and Portuguese flags; the slave-ships were more crowded than ever, from the necessity of avoiding capture, and the negroes were not unfrequently thrown overboard on a pursuit. The pecuniary penalties of the act were discovered to be inadequate to put down a traffic so lucrative as to cover all losses by capture. Brougham therefore, 1811, introduced a bill, which was carried unanimously, making the slave-trade felony, punishable with 14 years' transportation, or from three to five years' imprisonment with hard labor. An act of 1824 declared it piracy, and as such, a capital crime, if committed within the admiralty jurisdiction; and the statute of 1837, mitigating the criminal code, left it punishable with transportation for life. Among the philanthropic projects due to the exertions of the Anti-slavery Soc. was the establishment of the colony of Sierra Leone, on the coast of Africa, which had been formed by the Brit. govt. 1787, in order to show the possibility of obtaining colonial produce without slave-labor; and which, after the abolition of the slave-trade, became a settlement for the negroes captured by British cruisers.

The United States prohibited importation of slaves from Africa 1808; and the same was in the course of time done by the S. Amer. republics of Venezuela, Chili, and Buenos Ayres, by Sweden, Denmark, Holland, and during the Hundred Days after Napoleon's return from Elba, by France. Great Britain, at the peace, exerted her influence to induce other foreign powers to adopt a similar policy; and eventually nearly all the states of Europe have passed laws or entered into treaties prohibiting the traffic. The accession of Portugal and Spain to the principle of abolition was obtained by treaties of date 1815 and 17; and by a convention concluded with Brazil 1826, it was declared piratical for the subjects of that country to be engaged in the slave-trade after 1830. By the conventions with France of 1831 and 33, to which nearly all the maritime powers of Europe have since acceded, a mutual right of search was stipulated within certain seas, for suppressing this traffic. The provisions of these treaties were further extended 1841 by the Quintuple Treaty between the five great European powers, subsequently ratified by all of them except France. The Ashburton treaty of 1842 between Britain and the United States provided for maintenance by each country of a squadron on the African coast; and 1845 a joint co-operation of the naval forces of England and France was substituted for the mutual right of search.

The limitation of the supply of negroes naturally led, among other good results, to a greater attention on the part of the masters to the condition of their slaves. But the attention of philanthropists was next directed toward abolishing S. altogether. In England societies were formed with this end, an agitation was set on foot, and attempts were made, for some time without success, to press the subject of emancipation on the house of commons. At length, 1833, a ministerial proposition for emancipation was introduced by Stanley, then colonial sec., and an emancipation bill passed both houses, and obtained the royal assent, 1833, Aug. 28. This act, while it gave freedom to the slaves throughout all the British colonies, at the same time awarded an indemnification to the slave-owners of £20,000,000. S. was to cease 1834, Aug. 1, but the slaves were for a certain time to be apprenticed laborers to their former owners. Objections being raised to the apprenticeship, its duration was shortened, and the complete enfranchisement took place 1838.

The French emancipated their negroes 1848; as did most of the new republics of S. America at the time of the revolution; while the Dutch slaves had freedom conferred on them 1863. In Hayti, S. ceased as far back as 1791, its abolition having been one of the results of the negro insurrection of that year. In Portugal it was enacted 1858 that all slaves belonging to Portuguese subjects should be free after 20 yrs.: hence, since 1878 S. has been illegal throughout all the Portuguese provinces. Many of the Spanish Amer. states abolished S. on declaring their independence; the rest have since that time abolished the institution. In Brazil a law of gradual emancipation was passed 1871, freeing all children born after that date, though holding children born of slave women to be apprentices of their mothers' owners for 21 years.—A treaty between Great Britain and the Sultan of Zanzibar secures, in promise, the speedy abolition of the slave-trade on the opposite e. coast of Africa. The expedition of Sir Samuel Baker, 1873, was announced as having ended the slave-trade s. of Egypt as far as the equator. How far the khedive was sincere in coupling this object with the conquest of the Nile regions is doubtful; and it is certain that most of his officers and an army of slave-hunters are bent on defeating the attempt.

Slavery in the United States.—In presence of the famous statement in the Declaration of Independence, that 'all men are born free and equal, and possess equal and inalienable rights to life, liberty, and the pursuit of happiness,' the colonies which threw off the British yoke and became the United States contained several hundred thousand negro slaves, whose condition of S. was expressly recognized in the constitution of the United States as ratified 1788—by a provision for rendition of fugitive slaves. The regulation of this particular subject was delegated to the federal govt., S. being otherwise left to be governed by the laws of the states where it existed (see CONSTITUTION OF THE UNITED STATES—Art. IV., Sec. 2). S. established itself firmly in the southern states, where negro labor was required for cultivation of sugar and cotton, while it declined in the northern states, where it was not needed, and was even unprofitable; and after the limitation of the supply from Africa. the breeding of slaves went on to a large extent in Md. and Va. for supply of the other states of the south. The different position of the northern and southern states regarding slavery combined, with other causes, to engender that diversity of feeling and interest between north and south out of which arose the civil war.

S. was from the beginning recognized as an evil to be abated: the leaders of public opinion—Washington, Franklin, Hamilton, Jefferson, etc., deemed it inconsistent with the principles of free government. An abolition soc. was founded in Penn. 1775, with Benjamin Franklin as its pres.; and similar organizations soon arose in Mass., Conn., R. I., Del., Md., and Va. A determined and aggressive agitation against the continuance of the institution was begun 1831 under the leadership of Garrison (q.v.), Wendell Phillips (q.v.), Arthur Tappan (q.v.), Lewis Tappan (q.v.), and many others (see various biographical titles), who declared slaveholding 'a sin against God and a crime against humanity.' The liberty party, the free soil party, and finally the republican party were doubtless inspired by the principles of human freedom proclaimed by these leaders; though neither the free soil party nor the republican party was in any sense committed to the policy of abolition. Many among them hoped for its abolition; but the principle of the party, as concerned S., was to *prevent its extension* as a political power perilous to the union of the states. The increased consumption of cotton had led to an increased demand for slave labor; and 1820, when Missouri was admitted to the Union as a slave state, a compromise was entered into by which slavery was legalized southward, but prohibited northward of 36° 30′ n. lat.: see MASON AND DIXON'S LINE: COMPROMISE MEASURES OF 1850: MISSOURI—*History*. California, though partly lying s. of this geographical line, was admitted as a free state, the southern party obtaining in compensation the boon of an amendment of the Fugitive Slave Law, making it penal to harbor runaway slaves or aid in their escape. A belated moral awakening, accompanied by a reaction against the extreme and dictatorial policy of the south, taking distinct political form in Lincoln's election as president, was the signal for a long-threatened secession of the southern states, and for the bloody war which ended in the overthrow of the principle of state-sovereignty and the consolidation of the Union, with S. totally eliminated. Even so late as the second year of the rebellion, 1862, Aug. 22, Pres. Lincoln wrote, 'My paramount object is to save the Union, and not either to save or destroy slavery.' When the abolition of S. appeared to be demanded in the interest of the Union and as a military measure hastening the downfall of the Confederate govt., Pres. Lincoln—having given warning by a preliminary proclamation—issued, 1863, Jan. 1, his Proclamation of Emancipation, as follows:

SLAVERY.

PROCLAMATION.

Whereas, On the 22d day of Sep., in the year of our Lord 1862, a proclamation was issued by the president of the United States, containing among other things the following, to wit:

That, on 1st day of Jan., in the year of our Lord 1863, all persons held as slaves within any state, or any designated part of a state, the people whereof shall then be in rebellion against the United States, shall be thenceforward and forever free, and the executive government of the United States, including the military and naval authority thereof, will recognize and maintain the freedom of such persons, and will do no act or acts to repress such persons, or any of them, in any efforts they may make for their actual freedom.

That, the executive will, on the 1st day of Jan. aforesaid, by proclamation, designate the states and parts of states, if any, in which the people thereof respectively shall then be in rebellion against the United States, and the fact that any state, or the people thereof, shall on that day be in good faith represented in the congress of the United States by members chosen thereto at elections wherein a majority of the qualified voters of such state shall have participated, shall, in the absence of strong countervailing testimony, be deemed conclusive evidence that such state and the people thereof are not then in rebellion against the United States.

Now, therefore, I, Abraham Lincoln, president of the United States, by virtue of the power in me vested, as commander-in-chief of the army and navy of the United States, in time of actual armed rebellion against the authority and government of the United States, and as a fit and necessary war-measure for repressing said rebellion, do, on the 1st day of Jan., in the year of our Lord 1863, and in accordance with my purpose so to do, publicly proclaim for the full period of 100 days from the day of the first above-mentioned order, and designate as the states and parts of states wherein the people thereof respectively are this day in rebellion against the United States, the following, to wit: Arkansas, Texas, Louisiana, except the parishes of St. Bernard, Plaquemines, Jefferson, St. John, St. Charles, St. James, Ascension, Assumption, Terre Bonne, Lafourche, St. Mary, St. Martin, and Orleans, including the city of New Orleans, Mississippi, Alabama, Florida, Georgia, South Carolina, North Carolina, and Virginia, except the 48 counties designated as West Virginia, and also the counties of Berkeley, Accomac, Northampton, Elizabeth City, York, Princess Ann, and Norfolk, including the cities of Norfolk and Portsmouth, and which excepted parts are, for the present, left precisely as if this proclamation were not issued.

And by virtue of the power, and for the purpose aforesaid, I do order and declare that all persons held as slaves within said designated states and parts of states are, and henceforward shall be, free; and that the executive government of the United States, including the military and naval authorities thereof, will recognize and maintain the freedom of said persons.

And I hereby enjoin upon the people so declared to be free, to abstain from all violence, unless in necessary self-defense, and I recommend to them, that in all cases, when allowed, they labor faithfully for reasonable wages.

And I further declare and make known that such persons of suitable condition will be received into the armed service of the United States to garrison forts, positions, stations, and other places, and to man vessels of all sorts in said service.

And upon this, sincerely believed to be an act of justice, warranted by the constitution, upon military necessity, I invoke the considerate judgment of mankind and the gracious favor of Almighty God.

In witness whereof, I have hereunto set my hand and caused the seal of the United States to be affixed.

[L.S.] Done at the city of Washington, this 1st day of Jan., in the year of our Lord 1863, and of the independence of the United States of America the 87th.

By the President: ABRAHAM LINCOLN.

WILLIAM H. SEWARD, Secretary of State.

The U. S. sec. of state proclaimed 1865, Dec. 18, the adoption by 27 out of the 36 states of a constitutional amendment (which had been voted in congress 1865, Jan.) forever prohibiting 'S. and involuntary servitude' within the United States (see CONSTITUTION OF THE UNITED STATES—Art. XIII.).

S. no longer exists anywhere on the Amer. continent, nor in the former Spanish colonies of Cuba and Porto Rico, now under the American flag. In Africa S. and the slave trade still flourish except where those practices are repressed by European governments.

SLAVIC, n. *slăv'ĭk:* Slavonic. CHURCH SLAVIC, a name given to an ancient dialect of Bulgaria, from its being used as the sacred language of the Greek Church; called also Old Bulgarian.

SLAV'IC LANGUAGE AND LITERATURE: generic terms (like Celtic or Teutonic language, etc.) for a group of kindred languages and writings of peoples belonging to the great Indo-Germanic or Aryan family. The leading characteristics of the Slavic tongues are the completeness of their system of declensions (nouns and adjectives have 7 cases, and the Sorbish and the Slovenish languages have the dual number), lack of articles, absence of pronouns in conjugation of the verb, pure vowel-endings, fixed quantity of the syllables, free construction of sentences, and richness of vocabulary. The earliest dialect of Slavic that received a literary culture was the 'Old Bulgarian,' better known as the 'Church Slavic;' which, however, failed to become the literary vehicle for all the Slavic peoples, inasmuch as the special dialect of each gradually acquired a literature of its own. The existing Slavic languages are: Great Russian; Little Russian; White Russian; Bulgarian (including Old Bulgarian, the ecclesiastical language; and New Bulgarian, under which are comprised Upper and Lower Mœsian and Macedonian); Servo-Croatian, comprising Herzegovinian, Syrmian, Resanian; Slovenish, comprising the dialects of Upper, Middle, and Lower Carniola, Styrian, Ugro-Slovenish, and Croato-Slovenish: all of the foregoing belong to the s.e. branch of the Slavic languages. To the w. branch belong Polish, including Masovian, Great Polish, Silesian, and Kashoulish; Bohemian, including Czechish, Moravian, and Slovakish; Lusatian Wendish, or Sorbish, comprising Upper and Lower Lusatian. Polabish, belonging to this division, is now extinct.—SEE BOHEMIA: POLISH LANGUAGE AND LITERATURE: RUSSIAN LANGUAGE AND LITERATURE: SERVIA.—In regard to Slavic literature, considering the articles above referred to, it is necessary to say only that at present the Russian branch of the Slavic is the richest in the number of its published works; but as regards literary merit, the Polish ranks first, having cultivated with great success almost all sorts of literature, and possessing in particular an exquisite poetry. The Bohemian and Servian literatures both contain many fine and original productions.—See Morfill's *Slavonic Literature* (1883); works of Schafarik, Eichhoff (in French), Mickiewicz, Talvi (Eng. transl.), Krek and Miklosich (*Vergl. Grammatik*).

SLAVONIA, *slâ-vō'nĭ-a:* province of Austria, e. of Croatia (q.v.), with which it is now politically united. It is bounded n. by the Drave, e. by the Danube, s. by the long strip of marsh-land known as the Slavonian Military Frontier, which stretches between it and the Save. Area of S., about 6,600 sq. m. The greater part of the surface of S. consists partly of eminences clothed with vines and fruit-trees, and partly of fertile plains; the existence of great marshes renders the climate insalubrious. The mountains are rich in coal, marble, and mineral springs. The principal products are all sorts of grain, particularly maize and wheat, leguminous plants, fruit in abundance, especially apples and plums, walnuts, chestnuts, melons, tobacco, wine, etc. There is little manufacturing industry. The inhabitants of S. belong to the Slavic family (see SLAVS), and call their land Slavonska; themselves Slavonaz. They speak the so-called Illyrian or Servian tongue: see SERVIAN LANGUAGE AND LITERATURE. The Slavonians proper are a handsome, tall, and slender race. The prevailing forms of religion are the Rom. Cath. and the Greek Orthodox; the Reformed religion numbers a few thousand adherents. Pop. S. (1880) 377,616; (1890) Slavonia and Croatia, 2,184,414. See CROATIA.

SLAVONIC, a. *slă-vŏn'ĭk*, or SLAVONIAN, a. *slă-vō'nĭ-ăn:* pertaining to the Slavs or Slavonians; spelled also SCLAVON'IC and SCLAVO'NIAN: see SLAV.

SLAVS, or SLAVES, *slâvz* or *slăvz*, or SLAVO'NIANS [native name originally, *Slovenin*, plu. *Slovene;* later, *Slavjanin*, plu. *Slavjane*, derived by some from *Slava*, fame, but better from *Slovo*, word; thus meaning 'speaking' or 'articulate,' as distinguished from other nations, whom they called Niemetz, or 'Mutes']: general name of a group of nations belonging to the Aryan family, whose settlements extend from the Elbe to Kamtchatka, and from the Frozen Sea to Ragusa on the Adriatic, the whole of e. Europe being almost exclusively occupied by them. They were settled in these regions before the dawn of history, and are comprehended by ancient writers under the designations Sarmatians and Scythians. The original names of the Slavic tribes seem to have been Winds or Wends (*Venedi*) and Serbs. The former of these names occurs among the Roman writers; and later in Jornandes, in connection with the commercial peoples of the Baltic Sea; the latter is spoken of by Procopius as the ancient name common to the whole Slavic stock. The earliest historical notices extant represent the S. as having their chief settlements about the Carpathians, from which they spread n. to the Baltic, w. as far as the Elbe and the Saale, and later, after the overthrow of the kingdom of the Huns, s. beyond the Danube, and over the whole peninsula between the Adriatic and the Black Sea. These migrations ceased in the 7th c.; the division of the Slavic stock into separate branches became more complete, and gradually they began to form into independent states. The various sections of the stock may be divided into two groups, the southeastern and the western.

The Southeastern Group comprehends: (1) Russians, viz.: *Great Russians*, occupying the govts. around Moscow and extending n. to Novgorod and Vologda, s. to Kieff and Veronezh, e. to Penza, Simbirsk, and Vyatka, w. to the Baltic provinces and Poland; *Little Russians*, including the Rousines or Rousniaks in Galicia, and the Boiki and Gouzouli in Bukovina: drawing a straight line from Sandec, near Cracow, to the Asiatic frontier of Russia, we find the language of the Little Russians the dominant one of Galicia and all the s. parts of Russia till we come to the Caucasus; *White Russians*, inhabiting the w. govts. These three divisions number about 42,000,000, 17,240,000, and 4,300,000 respectively. (2) *Bulgarians*, including those in Russia, Austria, Roumania, Bulgaria, E. Roumelia, and Macedonia: total number about 6,000,000. (3) *Servo-Croats*, including those of Servia, Montenegro, s. Hungary: total about 6,500,000. Here also may be placed the *Slovenes*, including those in Styria, Carinthia, and Carniola, about 1,350,000.

The Western Group comprises: (1) *Poles*, divided between Russia, Austria, and Prussia; they number about 10,300,000; under this head may be classed the *Kashoubes*, near Dantzic, numbering about 112,000. (2) *Czechs* and *Moravians*, about 5,000,000; to these may be added the *Slovaks*, 2,400,000. (3) *Lusatian Wends*, 150,000. Grand total—Slavs, 95,350,000.

The S. are represented by ancient writers as an industrious race, living by agriculture and the rearing of flocks and herds; as hospitable and peaceful, and making war only in defense. Linguistic research has shown that the S. in very early times were acquainted with gold, silver, copper, and tin; with the plow, wheat, barley, oats, millet, rape, lentil, bean, poppy, hemp, leek; with beer and wine. Noticeably, their language, like nearly all European tongues (except modern English), had distinct terms for *Jus* and *Lex*. They possessed the arts of braiding, weaving, carpentry, iron-working; they had names for the oak, lime-tree, beech, willow, birch, pine; also for the apple, pear, cherry, plum. The feeling of nationality was strong among them. The government had a patriarchal basis, and chiefs or princes were chosen by assemblies. But contact with the feudal institutions of the Roman-German empire gradually altered this primitive constitution: the Slavic princes strove after unlimited power, like that of the emperors; and the chiefs sought to dominate over the people, like the feudal nobility. In the 11th, 12th, and 13th c., nobility became a hereditary privilege throughout the Slavic states. The worst kind of feudalism took root, and the people sank into the condition of serfs. Between them and the nobles there was no third or middle class, as the peculiar privileges of the nobility prevented the growth of cities. See SERF: RUSSIA.

The *religion* of the ancient S., like that of the Teutonic nations, seems to have been, in many of its features at least, a kind of nature-worship; not, however, without the idea of One supreme power, to whom the other agencies were subordinate. The chief deity, whose worship seems to have been common to all the Slavic tribes, was Swiatowit, with whom were associated, on a nearer footing of equality than the other gods, Perun and Radegast—if, indeed, these three names do not merely denote different personations or manifestations of the same power. In this triad, Swiatowit is considered as most analogous to Mars and Zeus, Perun to Jupiter and Thor, and Radegast to Mercury and Odin. Of the numerous gods of inferior order were Prowe, god of justice; Prija (= Freya), Venus; Bjelbog, the White god, and Cernobog, the Black god; together with multitudes of demons and spirits good and bad. The images of the Slavic divinities (a stone statue of Swiatowit was in recent times discovered in e. Galicia) had striking resemblance to those of India. Swiatowit had four heads, Rugewit (god of war) had seven faces, and Perun four, and so on. The S. seem to have been not without some crude notion of existence and retribution after death. Worship was performed in groves and temples, cattle and fruits being offered by the priests, whose office must have been performed originally by the head of the family or the chieftain, as the common name for priest and prince (*kniez*) shows.—The eastern S. received Christianity from Byzantium in the 9th c., through the instru mentality of Cyril (q.v.) and Methodeus; the western, from Rome and Germany.—Further, see Panslavism.—See Schafarik, *Slaw. Alterthümer*.

SLAY, v. *slā* [AS. *slean;* Goth. *slahan;* Icel. *sla;* Ger. *schlagen*, to smite]: to put to death by a weapon; to kill; to murder. Slay'ing, imp. Slew, pt. *slô*, did slay. Slain, pp. *slān*. Slay'er, n. *-ėr*, one who slays.—Syn. of 'slay': to kill; murder; massacre; assassinate; slaughter; butcher.

SLAY, or Slaie, n. *slā:* a weaver's reed: see Sley: Sleid.

SLEAFORD, *slē'fėrd:* town of Lincolnshire, England, on the right bank of the Slea, a branch of the Witham, 17 m. s.s.e. from Lincoln, 52 ft. above sea-level. It is a well-built town, and has a fine church, built in the 13th c. Pop. (1881) 4,967.

SLEAVE, n. *slēv* [Dan. *slöife*, a slip-knot: Ger *schleife*, a noose]: a tangled mass of fibrous matter; the knotted or entangled part of silk or thread; the refuse of the cocoon which cannot be wound off, but only spun: V. to separate threads; to sley. Sleav'ing, imp. Sleaved, pp. *slēvd:* Adj. raw; unwrought.

SLEAZY, and Sleezy, a. *slē'zĭ* [Ger. *schleissig*, worn out, threadbare; *schleissen*, to fray, to wear out]: wanting firmness of texture or substance; apt to fray or tear; thin; flimsy; weak.

SLED, n. *slĕd* [Dut. *slede;* Ger. *schlitten;* Dan. *slæde;* OHG. *slita;* Sw. *slede;* Icel. *sledi*, a sledge: Gael. *slaod*, to trail along the ground, to drag; *slaod*, a sledge]: a carriage or wagon without wheels, and moving on slides, used for conveying loads over frozen snow and ice: V. to convey on sleds. Sled'ding, imp.: N. the act of transporting on a sled; the means of conveying on sleds. Sled'ded, pp.: Adj. in *OE.*, mounted on a sled.

SLEDGE, n. *slĕj* [from Sled, which see]: a sort of carriage made to slide on ice or frozen snow, or to run on low wheels; a sleigh for riding on snow; same as Sled.

SLEDGE, n. *slĕj*, or Sledge-hammer [AS. *slecge;* Dan. *slægge;* Sw. *slägga*, a large smith's hammer: AS. *slean*, to strike: Ger. *schlag-hammer*, a sledge-hammer]: a large heavy hammer used by blacksmiths in beating out iron: V. to beat. Sledg'ing, imp. Sledged, pp. *slĕjd*.

SLEE, n. *slē* [perhaps a corruption of *sleigh*]: in *ship-building*, a cradle placed beneath a ship when hauling her up for repairs.

SLEEK, a. *slēk* [Icel. *sleikja;* Dan. *slikke*, to lick, to stroke with the hands: Icel. *slikr*, sleek: Gael. *slìob*, to lick: Dut. *slijpen*, to polish; *slijk*, grease]: having an even, smooth surface; smooth and glossy; soft: V. to make smooth; to render smooth or soft. Sleek'ing, imp. Sleeked, pp. *slēkt*. Sleekit, a. *slēk'ĭt*, in *Scot.*, glossy; flattering but deceitful. Sleek'ly, ad. *-lĭ*, smoothly; glossily. Sleek'ness, n. *-nĕs*, the state or quality of being sleek; smoothness and glossiness of surface. Sleek'y, a. *-ĭ*, of a sleek or smooth appearance.

SLEEP, n. *slēp* [Goth. *slepan;* Ger. *schlafen;* Dut. *slapen,* to sleep: OHG. *slaf,* drowsiness: Ger. *schlaff,* loose: Icel. *slapa,* to hang loose]: one of the normal conditions of the body, in which the voluntary exercise of the powers of body and mind is suspended; slumber; repose: in *plants,* a peculiar vital effect produced on some expanded flowers, and the leaflets of some leaves, by which they are closed or folded together at certain times (see SLEEP OF PLANTS): V. to take rest in sleep; to slumber; to repose; to be inattentive; to live thoughtlessly; to be unnoticed or unagitated, as a subject or question; in *Scrip.,* to rest in the grave. SLEEP'ING, imp.: ADJ. reposing in sleep; resting; dormant, or not acting: N. state of being at rest. SLEPT, pt. and pp. *slĕpt.* SLEEPER, n. *slēp'ėr,* one who sleeps; a lazy person: timber laid *asleep* or resting along its whole length—used chiefly along the top of dwarf-walls for support of the timbers of the ground-floor of houses. The timbers supporting railway rails, and laid at right angles to them across the railway, are also called sleepers or cross-sleepers, but more usually ties [in the sense 'a beam of timber,' perhaps from Norw. *sleip,* a smooth piece of timber]. SLEEP'Y, a. *-ĭ,* drowsy; heavy. SLEEP'ILY, ad. *-ĭ-lĭ,* drowsily; with desire to sleep; lazily. SLEEP'INESS, n. *-nĕs,* drowsiness. SLEEP'LESS, a. *-lĕs,* having no sleep; wakeful. SLEEP'LESSLY, ad. *-lĭ.* SLEEP'LESSNESS, n. *-nĕs,* the state of being sleepless. SLEEP-WALKER, one who acts and walks in sleep. SLEEP-WALKING, the practice of walking in sleep; somnambulism. SLEEPING PARTNER, one engaged in a business in which he has embarked capital, but in the conducting of which he does not take an active part. SLEEP LIKE A TOP, to sleep soundly and quietly, referring to the steady imperceptible movement of a top when gyrating very rapidly.—SYN. of 'sleep, v.': to slumber; rest; doze; repose;—of 'sleepy': dull; drowsy; sluggish; inactive; soporiferous; somniferous; lazy; heavy.—*Sleep* is a state of suspension of the sensory and motor functions which appears to alternate in all animals with the active condition of those functions, and which may be made to give place to it by the agency of appropriate impressions on the sensory nerves. The necessity for S. arises from the fact that the exercise of the animal functions is in itself destructive of the tissues of the organs which minister to them; so that if the waste produced by their action were not duly repaired, they would speedily become unfit for further use; and it is on the nutritive regeneration of the tissues which takes place during true healthful S. that its refreshing power depends. While the sensory and motor functions are suspended during S., the organic functions are uninterruptedly carried on, the respiratory, cardiac, and peristaltic movements proceeding with equal uniformity during the sleeping and waking states.

The direct cause of S. is that feeling of exhaustion or fatigue usual when the waking activity has continued during a considerable portion of the 24 hours—a feeling that the brain requires repose; and, in fact, unless the brain be in an abnormal condition, S. will at last supervene, from the inability of that organ to sustain any further demands on its energy. Among predisposing aids to the access of S. are especially the *absence* of sensorial impressions; thus, darkness and silence may promote repose; and the cessation of the sense of muscular effort, usually resulting when a position is taken that can be sustained without effort, is conducive to S. On the other hand, persons accustomed to live where there is continuous noise, as in the neighborhood of mills or forges, often cannot sleep if the noise is suspended. These cases, however, probably fall within the next general predisposing cause—namely, the *monotonous repetition* of sensorial impressions. Thus, the droning voice of an unimpressive reader, or the gentle ripple of the ocean, the hum of bees, the rustling of foliage, and similar monotonous impressions on the auditory nerves, are usually provocative of S. In these and similar cases, the influence of the impressions is exerted in withdrawing the mind from consciousness of its own operations, and in suspending the directing power of the will; and this is the case even when the attention is, in the first instance, *voluntarily* directed to them, as in some of the plans which have been recommended for inducing S. when there is no spontaneous disposition to it. In other methods, the attention is fixed on some internal train of thought, which, when once set going, may be carried on automatically (without activity of the will), such as counting numbers or repeating a Greek verb. In either case, when the sensorial consciousness has been once steadily fixed, the monotony of the impression (whether received from the organ of sense or from the cerebrum) tends to retain it there; so that the will abandons, as it were, all control over the operations of the mind, and allows it to yield itself up to the soporific influence. This last method is peculiarly effectual when the restlessness is dependent on some mental agitation, provided that the will has power to withdraw the thoughts from the exciting subject, and to reduce them to the tranquillizing state of a mere mechanical repetition.

The access of S. is sometimes sudden, the individual passing at once from full mental activity to entire torpor. Usually, however, it is gradual, the mind while remaining poised, as it were, between S. and wakefulness being 'pervaded by a strange confusion which almost amounts to wild delirium: the ideas dissolve their connection with it one by one; and its own essence becomes so vague and diluted that it melts away in the nothingness of slumber.' —Macnish, *Philosophy of Sleep*, p. 21. The amount of S. required by man is affected by so many conditions, e.g., *age, temperament, habits*, and previous exhaustion), that no general rule can be laid down on the subject. The condition of the *fetus* may be regarded as one of continuous slumber: on its entrance into the world, the infant passes most of its time in S.; and this is the case particularly in children prematurely born, such children seeming to awake only to receive food. During the whole period of growth, in which it is necessary that the *constructive* operations of the body should preponderate over the *destructive* processes, an excess of S. is required; and by the time that adult age has been attained, and the constructive and destructive processes balance each other, the necessary amount of S. has gradually fallen to or below 8 hours—one-third of the diurnal cycle. In very old age, again, in consequence of the deficient energy of the nutritive process, a larger amount of S. is required. As to the influence of temperament, a plethoric habit of body usually predisposes to S.; while thin wiry people of nervous temperament require comparatively little S. Persons of lymphatic temperament are usually great sleepers; but this is due probably, as Dr. Carpenter suggests, to the fact that 'through the dulness of their perceptions they are less easily kept awake by sensorial or mental excitement' than persons of livelier temperament. The influence of habit is considerable on the amount of S. required by individuals, and this influence may be brought to act on the protraction as well as the abbreviation of the usual period: as extreme examples, Gen. Eliott, renowned for his defense of Gibraltar, did not sleep more than four hours out of the 24 (probably the smallest allowance compatible with a life of vigorous exertion); while Dr. Reid, the metaphysician, could take at one time as much food, and afterward as much S., as were sufficient for two days. Moreover, the influence of habit in producing an aptitude for repose, or a readiness to wake, at particular periods, is well known. The S. of soldiers during a siege, of sailors or others who must take their rest as best they can, will often come on at command; nothing more being necessary to induce it than to assume a recumbent, or, at all events, an easy position, and to close the eyes. Thus, Capt. Barclay, in his notable match, in which he walked 1,000 m. in 1,000 successive hours, very soon acquired the habit of falling asleep the moment he lay down.

The condition of the great nervous centres during S. is a subject of much interest, on which considerable light was some time ago thrown by the observations of Dr. Arthur H. Durham (*Physiology of Sleep*, in *Guy's Hospital Reports*, 1860). These observations were made on a dog from which a portion of bone about as large as a 25-cent piece had been removed from the parietal region of the skull, and the subjacent dura-mater cut away to expose the brain; and Dr. Durham draws the following conclusions from them: 1. Pressure of distended veins on the brain is not, as is generally believed, the cause of S., for during S. the veins are *not* distended. 2. During S., the brain is comparatively bloodless; and the blood in the encephalic vessels is not only diminished in quantity, but also moves with diminished rapidity; and this is corroborated by observations of Dr. J. Hughlings Jackson on the ophthalmoscopic condition of the retina during S., the optic disk being then whiter, the arteries smaller, and the retina generally more anæmic than in the wakeful state. 3. The condition of the cerebral circulation during sleep is, from physical causes, that which is most favorable to the nutrition of the brain-tissue. Other observers, e.g., Dr. William A. Hammond, Dr. S. Weir Mitchell, François Franck, and Dr. Mosso, have by more refined methods reached the same conclusion: see in particular Mosso's work *Ueber den Kreislauf des Blutes im Menschlichen Gehirn.*

As to the conditions in which there is either excess or deficiency of S.: there are numerous instances on record in which S. has been continuously prolonged for weeks, or even months, especially among hysterical women. Dr. Carpenter refers to two such cases—namely, those of Samuel Chilton (*Phil. Trans.* 1694) and Mary Lyall (*Trans. Roy. Soc. Edin.* 1818). Blanchet, French physician, has recorded three cases of what he terms 'constitutional lethargic slumber' in *Comptes Rendus*, 1864. In one of these cases, the patient, a lady aged 24 years, who had slept 40 days when she was 18 years of age and 50 days when she was 20, at length had a sleep of nearly a year—viz., from 1862, Easter Sunday, to 1863, Mar. During this period a false front tooth was removed in order to feed her with milk and soup, her only food. She was motionless and insensible: the pulse was low, the breathing scarcely perceptible, there were no evacuations, and she showed no signs of leanness, her complexion remaining florid and healthy. In such cases it is not a prolongation of healthy natural S. that is present, but a condition of hysteric coma. Similar cases of prolonged lethargic S. are frequently recorded in public prints.

On the other hand, there are certain states of the nervous system in which there is either an entire absence of S. (and this may continue many days or even weeks) or incomplete sleeplessness. Complete sleeplessness is often a most important symptom of disease. It frequently accompanies certain forms of continued fever, inflammatory affections of the brain, the eruptive fevers, etc.; and when it continues many days and nights, delirium, followed by stupor, is very apt to supervene. When the wakefulness is unattended by any visible disorder sufficient to account for it, some serious disease of the brain is probably impending, such as palsy, apoplexy, or insanity. Partial sleeplessness is a symptom of far less grave import: it is frequent in persons whose minds are much engaged, or whose occupations subject them to great mental exertion or excitement of feeling, or to vicissitudes of fortune. It is, moreover, a symptom of many chronic diseases, e.g., gout, chronic rheumatism, skin-diseases, disorders of the urinary organs, dyspepsia, hysterica, etc. It may also be excited by certain beverages and articles of diet: thus, green tea and strong coffee, especially at unusual hours, often occasion wakefulness, and a full meal of animal food late in the day may disturb the S. of persons accustomed to dine earlier.

In the treatment of sleeplessness, or *insomnia*, the first indication is to remove its cause or occasion, and 'particularly to correct a close or contaminated air; to reduce the temperature of the apartment when it is high, and the quantity and warmth of the bedclothes; to remove all the excitants to the senses; to abstract the mind from all exciting, harassing, or engaging thoughts; and to remove or counteract the morbid conditions of which this is a symptom or prominent consequence.'—Copland's *Dictionary of Medicine*, art. 'Sleep and Sleeplessness.' A careful regulation of the secretions, by due use of purgatives and alteratives, will often remove insomnia; but it is *always dangerous to resort to the use of drugs:* the prudent physician will not prescribe those agents till all other means have failed. —See DREAMS: SOMNAMBULISM. It having been proved, as above mentioned, that the flow of blood to the brain is lessened during sleep (as indeed any one might infer from reduced mental action), sleep may be encouraged by exercise, which distributes the blood; by warming cold feet; sometimes by a little light food, which draws blood to the stomach. Stimulants, however (unless in hurtful stupefying amount), are likely to react in greater wakefulness after a short slumber; and the habit of using them is worse than insomnia. For very nervous persons, brief entire rest at intervals during the day is recommended as preparing for night's repose.

SLEEP OF PLANTS: one of the phenomena of Irritability (q.v.) in plants. Light acts on plants as a powerful stimulus, essential to their active and healthful vegetation. When light is withdrawn, the flowers of many plants close, and the greater number show a tendency to it, while leaves more or less decidedly incline to fold themselves up. The leaf-stalk also generally hangs down more or less, though in some plants it is more erect during sleep. The sleep of plants, however, is not always nocturnal: the flowers of some open and close at particular hours of the day. Thus, the crocus is a morning flower, closing soon after midday; while some flowers expand only in the evening or during the night. Their hours of vegetative rest are probably as essential to the health of plants as those of sleep to animals. Linnæus first observed the sleep of plants, in watching the progress of some plants of *lotus*, whose seeds he had sown.

SLEET, n. *slēt* [Icel. *sletta*, to splash: Norw. *sletta*, to fling: Dan. *slud;* Norw. *sletta;* Lap. *slatte*, sleet]: rain mingled with snow or hail: V. to rain with mingled snow or hail. SLEET'ING, imp. SLEET'ED, pp. SLEET'Y, a. *-ĭ*, consisting of sleet. SLEET'INESS, n. state of being sleety.

SLEEVE, n. *slēv* [AS. *slefe* or *slyf;* Fris. *slief*, what one slips the arm into: Bav. *schlaiffen*, to slip, as a bird its head under its wing: O.Dut. *sleve*, a sleeve: Fris. *slupe*, a pillow-slip]: the part of a coat or other garment made to cover the arm; in *mechanics*, a receiving-tube for a rod or other tube: V. to furnish with sleeves. SLEEV'ING, imp. SLEEVED, pp. *slēvd:* ADJ. having sleeves. SLEEVE'LESS, a. *-lĕs*, having no sleeves. SLEEVE-LINK, a clasp or fastener for sleeves. TO WEAR THE HEART UPON THE SLEEVE, to allow one's thoughts on any subject to become well known. TO LAUGH IN ONE'S SLEEVE, to laugh privately or unperceived—that is, behind the sleeve, which was formerly worn long and pendent. TO HANG ON OR PIN TO THE SLEEVE, to be or to make dependent on others.

SLEEVELESS, a. *slēv'lĕs* [Icel. *sliofr;* Dan. *slöv*, dull, inactive, blunt: comp. Scot. *thieveless*, unprofitable]: wanting reasonableness or pretext; bootless; fruitless, as a *sleeveless errand;* random; unmeaning. *Note.*—Mr. Skeat suggests that the phrase *sleeveless errand* refers to the herald's tabard, which had *no sleeves*, adding that heralds' messages were frequently profitless in their results.

SLEID, v. *slād* [from SLEY, which see]: to prepare for use in the weaver's sley. SLEID'ING, imp. SLEID'ED, pp.: ADJ. prepared for the sley; prepared for weaving.

SLEIGH, n. *slā* [a variation of SLED, which see: comp. Gael. *slighe*, a way, a journey]: in *N. Amer.*, a carriage or wagon on runners for travelling over ice or frozen snow: V. to travel in a sleigh. SLEIGHING, imp. *slā'ĭng:* N. act of riding in a sleigh; the state of the snow which admits of running sleighs. SLEIGHED, pp. *slād:* also SLED and SLEDGE.

SLEIGHT, n. *slīt* [Icel. *slægr*, crafty: Sw. *slög*, dexterous, expert: Ger. *schlau*, cunning, sly; *schlich*, artifice: comp. Gael. *slaight*, roguery—allied to SLY]: a trick or feat so dexterously performed that the manner of doing it escapes observation; dexterous practice; dexterity. SLEIGHT OF HAND, legerdemain.

SLEMMER, *slĕm'ėr*, ADAM J.: soldier: 1828–1868, Oct. 7.; b. Montgomery co., Penn. He graduated from West Point 1850; served in the Seminole war 1850–1, and on the Cal. frontier 1851–54; and taught in the U. S. Milit. Acad. 1855–59. He commanded troops in Fla. 1860–1, and by promptly occupying Fort Pickens saved that post to the Union. He took part in the siege of Corinth, and in the movements to Louisville and the relief of Nashville; and distinguished himself at Murfreesboro, where he was severely wounded. He was pres. of an examining board 1863, July—1865; and 1865 till his death was on duty at Fort Laramie, Kansas.

SLENDER, a. *slĕn'dėr* [O. Dut. *slinder*, thin, small: Bav. *schlenderling*, something dangling]: slim; thin; small in circumference compared with the length; slight; limited; inadequate. SLEN'DERLY, ad. *-lĭ*, without bulk; slightly; meanly. SLEN'DERNESS, n. *-nĕs*, the state or quality of being slender; weakness; slightness; spareness; want of plenty; insufficiency.—SYN. of 'slender': thin; slight; slim; fine; narrow; weak; feeble; inconsiderable; moderate; trivial; small; meagre; inadequate; spare; simple; abstemious.

SLEPT, v. *slĕpt:* pt. pp. of SLEEP, which see.

SLESVIG, *slĕs'vĭch* (Ger. SCHLESWIG, *shlĕs'vĭch*): duchy known till the 14th c. as South Jutland; formed part of the Danish dominions till 1864, when it fell into the hands of the Austrian and Prussian sovereigns. In terms of the treaty of 1867, it was incorporated with Prussia. Pop. (1864) 406,486; (1900) 1,387,968. Within its old recognized limits, it was bounded n. by Jutland; e. by the Little Belt and the Baltic; w. by the German Ocean; s. by Holstein, from which it was divided by the Eider and the Kiel canal; 3,492 sq. m. The country consists in its e. and central parts of a gently undulating plain, deeply indented with fiords and streams; and on its w. boundary of flat marshy tracts of ground, which require protection from encroachment of the sea by numerous dams.

The numerous islands which skirt the w. coast of S. have probably, at some not very remote period, formed part of the mainland; for navigation is so seriously impeded by the sand-banks, that this coast is now accessible for ships by only three passages. The cluster of small islands, the Halligers, which lie, unprotected by dams, in the midst of these submerged sand-tracts, are so constantly exposed to the action of waves and storms, that the inhabitants are compelled to build their houses on piles. Off the e. coast of S. are the islands of Alsen, Aroe, and Femern—where the principal bays and inlets are the Haderslev and Aabenrade Fiords, opening into the Little Belt; the Flensborg Fiord, the Slie, the Eckernforde Fiord, and the Kieler Fiord, ancient boundary between S. and Holstein on the s.e., while the Eider completed it on the s.w. The principal branches of industry are agriculture, rearing of cattle, fishing, and ship-building. The Slie is the chief seat of the herring and salmon fisheries, which, though still important, are far inferior to those of the middle ages, when, according to the Danish historian Saxo-Grammaticus, herrings were so plentiful in the Belts and Cattegat, that they could be caught with the bare hands. The chief towns of S. are Flensborg (q.v.) Slesvig, now cap. of the Prussian province of Schleswig-Holstein (q.v.), a very ancient city, formerly the key of Denmark (pop. about 16,000): see SCHLESWIG; Haderslev, Husum, and Tonder. In the s., and partly in Holstein, is Rendsborg (pop. 13,000). S. has 800 schools. The pop. of the former duchy is mixed: rather more than half speak Danish; of the remainder, about 30,000 persons who belong to the islands on the w. coast, formerly part of the old province of N. Friesland, still use the Frisic language, the rest of the inhabitants using either Low or High German. The original Danish element of S. has remained purest in the n. half of the old duchy; while in the s. parts, where the inhabitants are naturally brought much in contact with Holstein, they have of late years adopted the views, tastes, and language of their German neighbors. The Lutheran is the established religion.

In accordance with the conditions stipulated in the treaty of Vienna, 1864, Aug., by which the duchies of Holstein and S. were ceded to Austria and Prussia, the island of Aroe and other districts of S., about 115 sq. m., were to be reunited to Denmark; while the latter power was to give in exchange a territory of about 130 sq. m., which, though within the boundary of S., had hitherto been under the jurisdiction of Jutland.

S., which forms part of the ancient Cimbrian Peninsula, has from the earliest period been a debatable land between Danes and Germans; and according to German authorities, it was anciently included in the Marches of the empire, having been incorporated by Henry the Fowler 930, and reorganized by Otho I., when 948 the latter erected bishops' sees in Aarhuus, Ribe, and Slesvig. In 1027 the Danish king Knud (Eng. Canute) obtained from Conrad II. the recognition of the independence of S., which was declared to belong unconditionally to Denmark, and thenceforth given as a Danish fief of the crown to the younger sons of the regal house. In 1232 King Valdemar Seir, whose father, Prince Knud Laward, had ruled ably over the duchy, gave S.—then, and for some time later, known as S. Jutland—to his younger son Abel. The exact terms of the donation became a subject of dispute during the successive reigns of Valdemar's sons, Eric, Abel, and Christopher; and began the long course of civil wars and family feuds associated with this much-contested territory. After an interminable series of conflicts (of which see brief outline in Denmark—*History:* Germany—*North German Confederation:* etc.) came the outbreak in 1848, when, by the influence of the neighboring Holstein nobles, the Germanized great landed proprietors of S. entered on the course of armed opposition to the mother country, Denmark, which culminated in the forcible separation—by an Austro-Prussian army—of the duchy of S. from the Danish crown, completed in a conference at Vienna 1864, Aug. Ultimately, a dispute between Austria and Prussia as to the status of the two duchies S. and Holstein was made a pretext for the Austro-Prussian war of 1866; ending in the treaty of 1867, by which Austria abandoned her claims in favor of Prussia, but stipulated that a part of S. should be restored to Denmark. This stipulation, however, has never been carried into effect: the old duchy of S., with Holstein, has been incorporated as a province of Prussia in the German empire: see Schleswig-Holstein: also Holstein.

SLEUTH, n. *slôth* [Icel. *slód*, a trail in the snow: Gael. *slaod*, to trail along the ground (see Slot 1)]: in *Scot.*, the track of a man or beast, as known by the scent. Sleuth-hound, a blood-hound which tracks by scent.

SLEW, v. *slô:* pt. of Slay, which see.

SLEW, v., or Slue, v. *slô* [origin uncertain: Scot. *slewyt*, slipped]: to turn round, as a mast or boom about its axis, without removing it from its place; to turn round about. Slew'ing, or Slu'ing, imp.: N. in *mil.*, the turning of a gun or mortar on its axis without moving it from the spot on which it rests; the turning horizontally upon a pivot. Slewed, or Slued, pp. *slôd:* Adj. in *slang*, intoxicated—a drunken man moving unsteadily, as a ship does when it *slews* or changes its tack.

SLEY, n. *slā* [AS. *slæ*, a sley]: a weaver's reed: V. to part threads and arrange them in the reed or sley. Sley'ing, imp. Sleyed, pp. *slād.*

SLICE, n. *slīs* [OF. *esclice,* a splinter; *esclier,* to split. OHG. *slizan,* to slit: Ger. *schleissen,* to split: Icel. *slita,* to tear asunder (see Slit)]: a thin broad piece cut off; a broad piece; a broad plate with a handle for spreading plasters; a spatula: V. to cut into thin broad pieces; to cut into parts; to divide. Sli′cing, imp. Sliced, pp. *slīst:* Adj. cut into broad thin pieces. Slicer, n. *slī′sėr,* a broad flat knife. Sli′ces, n. plu. *-sĕz,* wedges of small angle driven immediately before launching under the shores, by which the ship is sustained on the shipway.

SLICH, or Slick, n. *slĭk* [Low Ger. *slich;* Ger. *schlich,* pounded and washed ore]: ore of a metal, particularly of gold, when pounded and prepared for working.

SLICK, a. *slĭk* [Dan. *slikke,* to lick: Icel. *slikja,* to sleek, to polish: the same word as Sleek]: in *OE.,* sleek; polished; smooth.

SLICK, n. *slĭk* [Ger. *schlich,* pounded ore prepared for further working]: the ore of a metal, particularly of gold, crushed and pounded. Slick′ings, n. plu. *-ĭngz,* in *mining,* narrow veins of ore. Slickensides, n. plu. *slĭk′n-sīdz* [Eng. *slick,* and *side*]: among *Derbyshire miners,* a variety of galena or sulphide of lead, which has acquired a smooth and shining striated surface: in *geol.,* the smooth striated and often glazed surfaces of faults or fissures of rock. They are produced by friction of the two surfaces during some movement of the rock. S. are seen oftenest in rocks bearing veins of metal, but sometimes in non-metalliferous rocks. When the surface of the S. is coated with a film of galena, pyrites, etc., as is often the case, it may be polished for use as a mirror, hence the French name for S., *miroire.* It is often seen also on the surface of carbonaceous slates, having the appearance of a thin lustrous black enamel on the dingy mass.

SLICKER, n. *slĭk′ėr:* in *leather working,* a tool for removing inequalities from, and imparting a polish to, a surface.

SLID, v., SLIDDEN: see Slide.

SLIDDER, v. *slĭd′dėr* [O. Dut. *slidderen,* to drag: W *llithr,* a slip, a slide]: in *OE.,* to slide with interruption. Slid′dering, imp. Slid′dered, pp. *-dėrd.* Slid′dery, a. *-dėr-ĭ,* slippery.

SLIDE, v. *slīd* [O. Dut. *slidderen,* to slip or fall: W. *llithr,* a slip, a slide: Sw. *sliddrig,* loose, flagging]: to move smoothly over a surface without leaving it; to move along the surface without walking; to pass smoothly along; to pass along silently and easily, as on ice; to pass silently and gradually from one state to another; to glide; to fall; to lapse; to thrust along: N. an even smooth course; a smooth and easy passage; ice prepared for sliding on; a miner's term for a minor slip or dislocation of the strata; the glass on which are mounted the pictures for display by means of a magic-lantern or similar instrument; in *music,* a grace consisting of two small notes moving by degrees. Sli′ding, imp.: Adj. slipping along a smooth surface; passing smoothly and easily; falling gradually: N. act of one who slides over ice; in *OE*, transgression. SLI'DED, pp. SLID, pt. pp. *slĭd.* SLIDDEN, pp. *slĭd'n.* SLIDER, n. *slī'dėr,* one who slides; the part of a machine or instr. that slides. SLIDE-RAIL, a contrivance for connecting a siding with the main line of a railway. SLIDE-REST, an all-important part of a planing-machine or lathe for insuring accuracy in the motion of the cutting-tool by holding and directing it. SLIDE-VALVE, in *locomotive engines,* the regulating-valve placed in the steam-chest to work over the steam-ports. SLIDING-KEEL, in a *small vessel,* a narrow oblong frame used to deepen the draught and sustain a ship against the force of a side wind. SLIDING-WAYS, in *ship-building,* two narrow inclined planes built strongly on the shipway, intended to form the tracks by which the cradle sustaining the vessel glides into the water.

SLIDELL, *slī-dĕl',* JOHN: 1793–1871, July 29; b. New York: U. S. and Confederate official. He graduated at Columbia Coll. 1810; began practice of law in New Orleans 1819; served one year as dist. atty.; was in congress 1843–45; in Mexico 1845–47 as U. S. minister, but not received there; and in the U. S. senate 1861, leaving when La. seceded. The same year, he sailed from Havana on a Brit. ship, with James M. Mason, as Confederate commissioner to France was captured by Capt. Wilkes, imprisoned in Fort Warren, released 1862 on demand of the Brit. govt., and went to France. While his mission waited for success on England's movement, Napoleon III. secretly favored a loan to the Confederacy, and the building in France of cruisers and rams. The vessels were ostensibly countermanded and sold; one of them was bought from Denmark, but too late. S. remained in England.—See *France and the Confederate Navy,* by John Bigelow (New York 1888).

SLIDING RULE: instrument invented by the Rev. William Oughtred, English mathematician, for solving arithmetical problems mechanically; consisting of three pieces of wood, of which two are fastened together by slips of brass at sufficient distance from each other to permit of a third sliding between them. The best size is about 2 ft. long, 2 inches broad, ¼ inch thick. One side of the rule has the following scales marked on it in order: a line of tenths of inches, of equal parts divided into tenths and hundredths of ft.; three lines of numbers, each line consisting of the numbers from 1 to 10 twice repeated; a line of sine rhumbs (logarithmic sines of each quarter-point of the compass); a line of meridional parts; and a line of equal parts. Of these, two of the lines of numbers are on the middle piece or *slider.* On the other side are—two lines of *natural scales,* including sines, secants, tangents, equal parts, etc.; two lines of logarithmic sines, two lines of logarithmic tangents, a third line of logarithmic sines, and a line of versed sines. Of these, one line of logarithmic sines and one of tangents are on the slider. The scale in most common use is that of numbers, and a description of its mode of use illustrates the whole working of the instrument. It is necessary, however, to notice, as a preliminary, that the scale of numbers is not evenly divided, as in this case only addition and subtraction could be performed, but is divided in proportion, not to the numbers, but to their logarithms, so that 3, whose logarithm is very nearly the half of that of 10, stands almost half-way between 1 and 10; and similarly of the other numbers. All questions of numerical proportion can thus be easily worked by means of the line of numbers on the slider, and the adjacent and corresponding one on the fixed part of the rule. To find a fourth number proportional to three given numbers, we place the first term (on the slider) opposite to the second term (on the fixed scale); and opposite the third term (on the slider) is the fourth or number required (on the scale). Multiplication is performed by making 1 the first term of a proportion, and division by making it the second or third. The other scales marked on the rule are useful in solving trigonometrical, geographical, and nautical problems, and the results obtained are much more accurate than one at first sight would believe. Sliding rules of circular form are not in any way preferable to the ordinary straight form.

SLIDING SCALE: scale of prices, wages, imposts, etc. adjusted to fluctuations in the price of raw material, agricultural products, or manufactured goods: as when the wages of iron-workers are raised or lowered as the price of (e.g.) steel rails rises or falls.—See Corn Laws.—The name S. S. is given sometimes to a Sliding Rule.

SLIGHT, a. *slīt* [Ger. *schlicht;* O. Dut. *slicht,* plain, even: Goth. *slaihts;* Icel. *slettr*, even, smooth: Dan. *slet,* flat, bad]: superficial; not thorough; not strong; not deep, as an impression; faint; small; inconsiderable; trifling; paltry; not done with effort; not forcible: N. a moderate degree of contempt, manifested by neglect or indifference; disregard; disdain: V. to disregard, as of no importance or unworthy of consideration; to neglect; in *OE.*, to throw carelessly; to overthrow: Ad. slightly. Slight′ing, imp. Slight′ed, pp. Slight′er, n. one who slights or disregards. Slight′ly, ad. *-lĭ,* in a slight manner; in a small degree; weakly; negligently; without regard; without force; scornfully. Slight′ness, n. *-nĕs,* the state or quality of being slight; want of force or strength; superficialness; negligence; want of attention. Slight′ingly, ad. *-lĭ,* with neglect; without respect.—Syn. of 'slight, a.': small; worthless; inconsiderable; weak; negligent; foolish; thin; trifling; unimportant; gentle; perishable; slender;—of 'slight, n.': neglect; disregard; inattention; contempt; disdain; scorn.

SLIGO, *slī′gō:* maritime county, province of Connaught, Ireland; bounded n. by the Atlantic and the Bay of Donegal, s. by Roscommon and Mayo, e. by Roscommon and Leitrim, w. by Mayo; 41 m. from e. to w., 38 m. from n. to s.; 461,796 acres, of which about 320,000 are under tillage or in pasture, and 140,000 uncultivated. The coastline is indented with numerous bays, and, except in the Bay of Sligo, dangerous for navigation. The surface rises gradually from the coast eastward as far as an elevated range called Slieve Gamph and the Ox Mountains, whose highest point rises 1,800 ft. S. contains comparatively few and small lakes, but some are picturesque, especially Lough Arrow and Lough Gill. The county is traversed by a branch of the Midland Great Western railway, connecting the county town of Sligo (q.v.) with Dublin. The mineral products are copper, lead, iron, and manganese. The climate is variable, and—though with frequent rains—mild and healthful. The plain of S. is a deep rich loam; and in the s. portion of the county are large tracts of corn-land and pasturage. The land is now chiefly used for pasturage. The S. fishery district comprises 110 m. of coast, and kept engaged (1879) 140 registered vessels, employing 572 men and 6 boys. In 1880 there were, at the national schools, 24,267 pupils.—Pop. (1881) 111,578; (1901) 84,083.

S. was anciently the seat of the O'Connors, and was the scene of many conflicts between the several branches of that family, whose domestic feuds facilitated the first inroads of the Anglo-Normans. The district contains many remains of the Celtic and of the Anglo-Norman period. Of the former, there is one very interesting called the Giant's Cairn, near Sligo; and there are many raths, cromlechs, and ancient caverns.

SLI′GO: chief town of the county of S., Ireland; on the river Garrogue; 131 m. n.w. from Dublin. S. had its origin in the erection of a Dominican abbey in the 13th c. by Maurice Fitzgerald, Earl of Kildare, around which—and a castle also built by him—a town was gradually formed: in the reign of James I., it received a charter. The modern town stands within a bend of the river, chiefly on the left bank; is mostly well built, and contains several handsome public edifices. It has few manufactures, but considerable commerce: (1880) 758 vessels, of 105,571 tons, entered and cleared the port. Exports are chiefly corn, flour, meal, butter, provisions, and yarn. Steamers ply regularly between S. and Glasgow, Liverpool, and Londonderry.—Pop. (1861) 13,361; (1871) 10,670; (1881) 10,764; four-fifths Rom. Catholics; (1891) 10,110.

SLILY, SLINESS: see under Sly.

SLIM, a. *slĭm* [O. Dut. *slim*, crafty; *slimgast*, a sly fellow: Gael. *slim*, slender: Ger. *schlimm*, evil, unwell: Icel. *slæmr*, vile]: slender; unsubstantial; slight; trifling; small; weak; of small diameter or thickness compared to the height. Slim′ly, ad. *-lĭ*. Slim′ness, n. *-nĕs*, the state of being slim; slenderness.

SLIME, n. *slīm* [Ger. *schleim, schlamm;* Icel. *slim;* Dut. *slijm*, slime: without the initial sibilant, AS. *lam;* Low Ger. *leem;* Ger. *lehm*, loam, clay: L. *limus*, mud]: glutinous mud; soft earth having an adhesive or sticky quality: V. to cover with slime; to make slippery. Slimy, a. *slī′mĭ*, consisting of soft adhesive earth; viscous; overspread with slime; glutinous. Sli′miness, n. *-mĭ-nĕs*, the quality of being slimy; glutinous matter. Slimes, n. plu. *slīmz*, mud containing metallic ores.

SLINESS: see under SLY.

SLING, n. *slĭng* [AS. *slingan,* to sling: Sw. *slinga,* to twist: Dan. *slingre,* to reel, to roll like a ship: Dut. *slingeren,* to sling: Ger. *schlingen,* to twist]: weapon consisting of a short leather strap with a round hole in the middle, and two cords about three feet in length. A round pebble being hung in the leather by the cords, the cords are held firmly in the right hand, and swung rapidly round: when the stone has attained great speed, one string is disengaged, on which the stone flies off at a tangent, its initial velocity being the same as it had at the last moment of revolution, and far greater than could be imparted in mere throwing. The S. was much used in ancient war.—Also, a S. is a support hung from the neck or breast to hold up a wounded arm: a rope by which a cask or bale is swung in or out of a ship: a throw: a stroke: V. to throw with a sling; to throw; to cast; to hurl; to hang by a rope so as to be moved; to move by means of a rope. SLING'ING, imp. SLANG, pt. *slăng,* did sling. SLUNG, pt. pp. SLING'ER, n. one who slings; a soldier of former times armed with a sling.

SLINK, v. *slingk* [AS. *slincan,* to creep or crawl: Ger. *schleichen,* to slink: Dut. *sleyken,* to sneak, to slink: Sw. *slinka,* to dangle: Swiss, *schlenken,* to sway to and fro]: to creep away meanly; to steal away; to sneak; to miscarry, as a female beast: ADJ. produced prematurely, as the young of a beast: N. the young of a beast brought forth prematurely. SLINK'ING, imp. SLANK, pt. *slăngk,* or SLUNK, pt. *slŭngk,* did slink. SLINKED, pp. *slĭngkt,* or SLUNK, pp. *slŭngk.* SLINKS, n. plu. the skins of prematurely born lambs, calves, etc.

SLIP, v. *slĭp* [Sw. *slippa;* Icel. *sleppa,* to get loose from, to slip: Ger. *schlüpfen;* Low Ger. *slippen,* to slip away: AS. *slipan,* to slip]: to move or glide involuntarily on the surface with one or both feet; to cause to slide involuntarily; not to tread firmly; to slide or glide; to move or fall out of place; to omit; to creep by oversight, followed by *into,* as an error into a MS.; to sneak or move meanly out of a place; to depart secretly; to escape, as from the memory; to fall into an error or fault; to lose by negligence; to leave slyly; to convey secretly; to separate twigs from a tree; to let loose; to throw off; to miscarry, as a beast: N. act of slipping; a twig cut from a tree; a long narrow piece; a narrow pew; an unintentional error or fault; a secret or unexpected desertion; a kind of loose frock for females; a plain skirt for wearing under a thin dress: in a *dock-yard,* a sloping bank or smooth inclined place with solid foundation, on which a ship may be built or repaired, and from which it may easily slide into the water, or upon which it may be drawn on a sort of railway for repairs (see LAUNCH: SHIP-BUILDING): a leash or string in which a dog is held, which *slips* or becomes loose by relaxing the hand; in *printing,* a portion of a column of type, or of matter before being made up into pages, struck off by itself; a proof from a column of type; in *pottery,* a mixture of powdered clay and flint; the stuff found in the troughs of grindstones on which edge-tools have been ground; in *geol.*, a familiar term for a fault or dislocation in strata, as if one portion had *slipped* away from the other; in *OE.*, a counterfeit piece of money formed of brass silvered. SLIP'PING, imp. SLIPPED, pp. *slĭpt.* SLIP'PER, n. *-pėr*, one who or that which slips, as a *slipper* of hounds; a loose easy shoe for indoor wear: ADJ. in *OE.*, slippery; not firm. SLIP'PERED, a. *-pėrd*, wearing a slipper; furnished with slippers. SLIP'PERY, a. *-pėr-ĭ*, not affording firm footing; not easily held; not to be depended on; changeable; unstable; in *OE.*, unchaste. SLIP'PY, a. slippery; smooth: N. a free translation of Nivose, the fourth month of the French republican year. SLIP'PERINESS, n. *-ĭ-nĕs*, the state or quality of being slippery; smoothness; want of firm footing. SLIP-BOARD, a board sliding in grooves. SLIP-COAT-CHEESE, n. a rich variety of cheese, made from milk warm from the cow, and resembling butter, but white. SLIP-KNOT, a knot which can slip along the line or rope around which it is made. SLIPSHOD, a. wearing shoes down at the heels only slipped on; careless in manners or style; shuffling. To SLIP ON, to put on rather hastily. To LET SLIP, to loose from the slip or noose, as a hound. To SLIP A CABLE, to let go the end of it—i.e., to loose it. SLIP-SLOP, n. *familiarly*, inferior, weak, or insipid liquor; weak writing or talking: ADJ. poor, weak, insipid. To GIVE ONE THE SLIP, to steal off unperceived; to elude pursuit.—SYN. of 'slip, v.': to slide; glide; sneak; slink; escape; err; omit; cut; miscarry;—of 'slip, n.': error; mistake; fault; leash; escape; desertion; twig;—of 'slippery': smooth; glib; uncertain; changeable; mutable; unstable.

SLIPPED, *slĭpt:* in heraldry, term of blazon applied to a leaf, branch, or flower which is represented with a stalk, and torn from the parent stem.

SLISH, n. *slĭsh:* OE. for SLASH, a cross-cut, as in the phrase *slish and slash*, representing the sound of a blow cutting through the air, or scissors closing sharply.

SLIT, n. *slĭt* [AS. *slitan*, to tear: Ger. *schleissen*, to slit, to split: Dan. *slide;* Sw. and Icel. *slīta*, to tear asunder, to separate]: a long cut or narrow opening; a cleft: V. to cut lengthwise; to make a long cut in; to cut. SLIT'TING, imp. SLIT, pt. pp. *slĭt.* SLIT'TER, n. *-tėr*, one who slits. SLITTING-MILL, a mill where iron bars or plates are cut into narrow slips, as nail-rods; a machine used by lapidaries for slicing stones.

SLITHER, v. *slĭth'ėr* [O. Dut. *slidderen*, to slip, to slide: W. *llithr*, a slip, a slide (see SLIDE: SLIDDER: GLIDE)]: to move smoothly into or over; to slide; to slip or slidder.

SLIVEN, *slēv'ėn*, or SLIVNO, *slēv'no*, or SELIMNIA, *sā-lĭm'nĭ-â*, or ISLEMNIYE, *ĭs-lĕm'nĭ-yė:* town in E. Roumelia, at the s. base of the Balkans, 750 ft. above the sea; the *Stlifanos* of Byzantine writers. It occupies an important strategic position between Adrianople and the Sliven; contains many mosques, four Christian churches, and a synagogue; and has manufactories of milit. clothing, silk goods, and red wine. Pop. (1888) 20,893; (1900) 24,548.

SLIVER, v. *slĭv′ėr* or *slī′vėr* [Dut. *schilfer*, a splinter: AS. *slifan*, to cleave, to split]: to cut or divide into long thin pieces: N. a long piece cut or rent off; a long continuous lap or twist of wool or cotton. Sli′vering, imp. Sli′vered, pp. *-vėrd.*

SLOAM, n. *slōm* [akin to Loam, or a corruption of it]: in *mining*, a layer of earth or clay between coal-strata.

SLOAN, *slōn*, Samuel: railroad president: b. Lisburn, Ireland, 1817, Dec. 25. He was brought to this country in infancy, and was educated at Columbia Coll. Grammar-school. He was partner in a commercial house 1845–57, and served as state senator 1858–9. Elected pres. of the Hudson River railroad 1855, he held that position about 10 years; was for two years commissioner of trunk-lines of railroad as arbitrator of disputes; since 1867 has been pres. of the Delaware Lackawanna and Western railroad; and in 1890 held a similar position in several other railroad companies.

SLOANE, *slōn*, Sir Hans, m.d.: physician and naturalist: 1660, Apr 16—1753, Jan. 11; b. Killyleagh, County Down, Ireland; of Scotch parentage, his father having been the chief of the Scottish colony settled in Ulster by James I. of Great Britain. He applied himself in boyhood to natural history and medicine; and in spite of an attack of hæmoptysis, which lasted from his 16th till his 19th year, he arrived in London 1679 with excellent knowledge of natural history, and fair acquaintance with medicine. His apprenticeship to Stafforth, pupil of Stahl (q.v.)—and the acquaintance, subsequently ripening into close friendship, with Boyle and Ray, two of the most celebrated naturalists of their time—did much to encourage and advance him in his favorite studies. During a brief sojourn in France, he attended the lectures of Tournefort and Du Verney; obtained on his return, by the active support of Sydenham (q.v.), a footing in London as a physician, and was elected a member of the Royal Soc. 1685, and of the Royal College of Physicians 1687; but in 1687, Sep., he accompanied Monk, Duke of Albemarle, to Jamaica, and investigated the botany of that and the adjoining islands with such zeal and diligence, during 15 months, that his herbarium numbered 800 species. Resuming his professional practice on his return, he became physician to Christ's Hospital (1694–1724), pres. of the College of Physicians (1719–35), sec. to the Royal Soc. (1693), foreign associate of the French Acad. of Sciences (1708), and succeeded Sir Isaac Newton as pres. of the Royal Soc. 1727. He had been created a baronet (the first Eng. medical man so honored), and physician-gen. to the army, 1716; and 1727 was appointed royal physician. In natural science he excelled more as a collector than as a philosopher. Though of remarkably delicate constitution, he lived to the great age of 92, dying at Chelsea. The chief point in S.'s moral character was his benevolence, as shown in the charitable uses to which he applied the whole of his salary as physician of Christ's Hospital, in his zealous promotion of various schemes for affording medicine and attendance gratuitously to the poor, and his support of the Foundling Hospital, of which he was one of the founders. By long perseverance, he formed a most extensive museum of natural history, a library of 50,000 vols., and 3,560 MSS., which he directed to be offered at his death to the nation for £20,000 (about one-fourth of its real value), and which formed the commencement of the British Museum (q.v.). He also contributed numerous memoirs to the *Philosophical Transactions*, whose publication he superintended for a number of years. But his great work was the *Natural History of Jamaica* (fol. 1707–25), containing also an excellent account of the topography, meteorology, and population of the island, which book was the means of introducing into the Pharmacopœia a number of excellent drugs previously unknown.

SLOAT, *slōt*, JOHN DRAKE: naval officer: 1780–1867, Nov. 28; b. Staten Is., N. Y. He entered the U. S. naval service as midshipman 1800, but was mustered out the following year. Again he entered the navy, as sailing-master 1812, and served till 1815 on the frigate *United States*, where he earned the thanks of congress and a silver medal for gallantry and skill in capturing the British frigate *Macedonian;* he was then promoted lieut. He served on the schooner *Grampus* in W. Indian waters, suppressing pirates 1823–25, in the mean time succeeding to the command of the *Grampus* 1824. Promoted successively to the grades of master-commandant and capt., he commanded the Pacific squadron 1844–46: at the beginning of the war with Mexico, he occupied San Francisco and other important points. He was placed on the reserve list 1855, and was retired 1861, but was promoted commodore 1862, and rear-admiral 1866.

SLOATS, n. plu. *slōts* [Norw. *slaate*, stem of a tree, a pole: Dut. *slot*, a lock or fastening: Gael. *slat*, a rod or yard]: the under-pieces of timber which keep the bottom of a cart together.

SLOBBER, v. *slŏb'bėr* [Ger. *schlabbern*, to slabber one's clothes, to sputter in speaking (see SLABBER)]: to spill upon; to slabber; to drivel. SLOB'BERY, a. *-ĭ*, moist; wet.

SLOBDOSK, *slŏb-dŏsk'*, or SLOBODSKOI, *slŏb-ŏds-koy'*: town of Russia, govt. of Viatka, on the river Viatka, about 16 m. n.e. of the town of the same name. Pop. 7,000.

SLOCKEN, v. *slŏk'n*, or SLOCK, v. *slŏk* [see SLAKE]: in *Scot.* and *OE.*, to slake or quench thirst. SLOCKENING, imp. *slŏk'n-ĭng*. SLOCKENED, pp. *slŏk'nd.*

SLO'CUM, HENRY WARNER: Union general in the civil war: b. Delphi, N. Y., 1827, Sep. 24. After graduation at West Point 1852, he served in the Florida war, and was promoted 1st lieut.; but resigned 1856, became a lawyer in Syracuse, N. Y., and was in the legislature 1859. He offered his services to the govt. 1861, May 21, was made col. of the 27th N. Y. vols., and was wounded at the first battle of Bull Run; but the next month, appointed brig gen., he commanded a brigade in Franklin's division, participated in McClellan's campaign 1862, and, on the transference of Franklin, took his place as division commander, May 15. Much was due to his efficiency at Gaines's Mills, Malvern Hill, and other scenes of battle; and he was promoted maj.gen., rendering signal service at South Mountain, Antietam, Fredericksburg, Chancellorsville, and at Gettysburg, where he commanded the right wing, repelling Ewell. After this he was assigned to duty in the dept. of the Cumberland; and in 1864, the year following the capture of Vicksburg, commanded that district. In Aug. of that year, taking command of the 20th corps in place of Hooker, he led in the occupation of Atlanta, and maneuvered the right wing in Sherman's great march 'to Richmond' by way of Savannah, meeting all the requirements of his important part, until the war ended, short of Richmond, with Lee's surrender to Grant and Johnston's to Sherman. After the war, Gen. Slocum practiced law in Brooklyn, N. Y.; was appointed col. in the regular army, 1866; was a presidential elector 1868; and was elected to congress 1868, 1870, and 1884. He was president of the board of city works in Brooklyn, and a commissioner of its bridge. He died in Brooklyn Apr. 14, 1894.

SLOE, n. *slō*, or SLOE-THORN, or BLACKTHORN [AS. *sla;* Scot. *slae*, the sloe: Dut. *slee;* Ger. *schlehe*, the sloe: O.Dut. *sleeuw*. tart], (*Prunus spinosa*): shrub of the same genus with the plum, and perhaps really of the same species with it and the bullace. It is generally a shrub 4–10 ft. high, sometimes becoming a small tree of 15-20 ft. It is much branched, and the branches terminate in spines. The youngest shoots are covered with fine down. The flowers are small, snow-white, and generally appear before the leaves. The fruit is ovate, or almost globose, pale blue with blackish bloom, and generally about the size of the largest peas. The S. is abundant in thickets and borders of woods, and in arid places in Britain and almost all parts of Europe; and found in old gardens, or escaped therefrom, in the United States. The shoots make beautiful walking-sticks. Although spiny, the S. is not suitable for hedges, as its roots spread and it encroaches on the fields. The bark is bitter, astringent, and tonic. The flowers with the calyx, are purgative, and are in some places much used in domestic medicine. The leaves are used for adulterating tea. The unripe fruit dyes black. The fruit, a small, sour, wild plum, is very austere. It is much in use on the continent of Europe for making a preserve, also in some places for making a kind of brandy. An astringent extract, *German Acacia*, is prepared from it, formerly much employed in cases of diarrhea and mucous and bloody discharges. The juice is largely used to impart roughness to port-wine, and in the fabrication of spurious port.

SLOGAN, n. *slō'găn* or *slŏ'găn* [a corruption of Gael. *sluagh-ghairm*, an army-cry—from *sluagh*, a host, army; *gairm*, a cry, a shout]: in *Scot.*, a Highland war-cry, or gathering-cry; the watchword used by troops in the field.

SLOGGER, n. *slŏg'ėr* [also, *in U. S.*, Slugger]: a hard hitter: a second-class racing-boat at Cambridge, corresponding to the torpids at Oxford [university slang].

SLOID, or SLOYD, n. *sloyd* [Sw. *slöjd*, skill]: system of exercises in manual training, beginning with the simplest and leading on to the most complex, but embodied from the outset in attractive and useful articles.

SLOOP, n. *slŏp* [O. Dut. *sloepe*, a light vessel or ship—from *sloepen*, to slip: F. *chaloupe*]: fore and-aft rigged vessel with one mast and a stationary or fixed bowsprit, differing but slightly from a Cutter (q.v.). In the yachting world the two types are approaching closer every year. In this country the S. being of less draught than a cutter, is generally provided with a centre-board; it carries a mainsail, gaff top sail, and one to three jibs. In former times the S. was used as a sea-going vessel, but is now practically confined to river and harbor work except in the case of fishing-smacks, among which sloops are still found. Sometimes square top-sails have been used. For some yachting contests, see Cutter.—In the navy, S. is a ship of war in size between a corvette and a brig; recently the name has been applied to warships of 2,000 tons, carrying 12 to 22 heavy guns. The term sloop-of-war is quite indefinite as to rig, and is now practically becoming obsolete except as referring to vessels of the old sailing navy.

SLOP, n. *slŏp* [Dut. *slabben*, to lap: Lap. *slabbot*, to sprinkle: Fris. *slobben*, to splash—a word imitative of the sound of dashing water: Gael. and Ir. *slaib*, mire]: water carelessly spilled or thrown about; a dirty wet place; in the *plu.*, coarse or poor liquid food; the liquid food of an invalid; the waste dirty water of the house: V. to soil by allowing water or other liquid to fall upon. Slop'ping, imp. Slopped, pp. *slŏpt.* Sloppy, a. *slŏp'pĭ*, muddy; plashy; miry and wet. Slop'piness, n. *-nĕs*, the state of being sloppy; muddiness. Slop-basin, a basin or bowl for holding the dregs of cups.

SLOP, n. *slŏp* [Icel. *sloppr*, a wide outer dress: AS. *slype*, a slop: Fris. *slupe*, a pillow-slip: Dut. *slobbe*, a pair of loose bagging breeches]: any loose outer dress; a smock-frock. Slops. n. plu. large loose trousers; drawers; cheap ready-made clothing; the clothing, etc. (in the Brit. navy, the bedding also), supplied to seamen from the ship's stores. Slop-shop, a shop where cheap ready-made clothes are sold. Slop-seller, one who sells cheap ready-made clothes. Slop-work, the manufacture of cheap ready-made clothing.

SLOPE, n. *slōp* [AS. *slipan*, to slip: Dut. *slap*, slack: Icel. *slapa;* Norw. *slape*, to hang down]: an oblique direction; a surface inclining gradually downward; a declivity: V. to form with a slope; to form or cut so as to have a downward direction; to be inclined; in *slang*, to hurry off; to disappear; to decamp. Slo'ping, imp.: Adj. inclining from a horizontal or level plane; oblique. Sloped, pp. *slōpt.* Slo'pingly, ad. *-lĭ.*

SLOPPY: see under Slo

SLOSH: see Slush.

SLOT, n. *slŏt* [Icel. *slód*, a track, a path: Gael. *slaod*, to trail along the ground: Pol. *slad*, a trace: Scot. *sleuth*, a track by the scent]: the print of a stag's foot on the ground. Slot-hounds, or Sleuth-hounds, hounds that track man or game by scent.

SLOT, n. *slŏt* [Sw. *slutt*, a slope]: a hollow. The slot of a hill, the depression or valley between two hills or ridges.

SLOT, n. *slŏt* [Dut. *slot*, a lock (see Sloats)]: a piece of timber which connects or holds together larger pieces; a flat wooden bar; a hollow for the head of a bolt or the like to work in; a depression or mortise in a plate of metal, or a slit through it; in a *theatre*, a trap-door in the stage: V. to slit or groove. Slot'ting, imp. Slot'ted, pp. Slotting-machine, machine-tool for cutting slots, mortises, or square grooves in metal. It is of great importance in mechanical engineering, and many very ingenious inventions have been made for facilitating the process. The principle is, however, very simple, and is the same in all. It consists of a cutting-tool, or chisel, held very firmly in an arm, which is pressed down and raised alternately. The tool is thus made to pare off a thin portion of the metal each time it descends, until it has cut a slot of sufficient size.—The 'Slot-drilling Machine' makes elongated slots by drilling.

SLOTH, n. *slōth* or *slŏth* [AS. *slæwth*—from *slaw*, lazy, slow: Dut. *sleeuw*, blunt (see Slow)]: disinclination to action or labor; habitual indolence; laziness; idleness; slowness; tardiness; sluggishness; a S. Amer. quadruped, so called from its slow and laborious walking (see below). Sloth'ful, a. *-fûl*, inactive; dull of motion; lazy. Sloth'fully, ad. *-lĭ*. Sloth'fulness, n. *-nĕs*, the state or quality of being slothful; the habit of idleness.—Syn. of 'slothful': idle; lazy; sluggish; inactive; indolent; inert.

SLOTH (*Bradypus*): genus of mammalia, of ord. *Edentata*, family *Tardigrada*. The name was given from observation of the very slow and awkward movements of the animals of this genus on the ground; but better acquaintance with their habits, and observation of their movements among the branches of trees, for which their conformation peculiarly adapts them, have shown it not appropriate nor descriptive. In like manner, Buffon's notion that they are creatures of imperfect organization, and doomed to a miserable existence, has been completely exploded. Their structure, like that of every other creature, is admirably adapted to their mode of life. They feed on the leaves, buds, and young shoots of trees, among whose branches they are born, and spend their whole life, rarely and unwillingly descending to the ground. They do not walk upon the branches, but cling beneath them, with the back downward. The fore-legs are much longer than the hinder ones, and are used for embracing a branch, or for drawing in the branches on whose foliage they are to feed; and both the fore and hind feet are furnished with very long, curved, and sharp claws, serving as strong hooks to clasp the branches from which they depend. The pelvis is very wide; and the hind-legs, thus widely separated, also diverge from one another. The structure of the wrist and ankle joints is such that the palm or sole is turned toward the body, so that upon the ground the animal is compelled to rest on the side of the hind-foot, while the length of the fore-legs causes it to rest on the knee or elbow of them, struggling forward by a shuffling movement, and dragging itself along by stretching out the fore-legs alternately and hooking the claws into the ground, or grasping some object. But in a dense tropical forest, sloths generally find it easy to pass from the branches of one tree to those of another, often taking advantage of a time when branches are brought within their reach by the wind. Where the trees are more distant from each other, they will eat the whole foliage of a tree ere they descend from it. The hair of sloths is coarse and shaggy, of very peculiar texture, inelastic, and much like grass withered in the sun, but affords excellent protection from insects, while it also gives them such an appearance that they are not readily observed except when in motion. The muzzle of sloths is short, and the tail is short. There are no incisor teeth, but sharp canine teeth, and eight molars in the upper, six in the lower jaw. The molars are cylindrical, penetrated by no laminæ of enamel, and adapted merely for crushing, not for grinding the food. For this, however, there is compensation in the stomach, which is somewhat imperfectly divided, by transverse ligatures, into four compartments, for the longer retention and more thorough digestion of the food, though there is no rumination. The female sloth produces only one young one at a birth, which clings to its mother till it becomes able to provide for itself. The voice of sloths is a low plaintive cry. Their chief enemies are large snakes, but against these they defend themselves by their powerful fore-legs and claws. A sloth has been known to grasp a dog round the neck and strangle it. There are very few species. One species has the fore-feet furnished with only two toes: the others have three. These, with other differences, have been made the ground of a recent division of the genus

Three-toed Sloth (*Bradypus tridactylus*).

into two. The Two-toed S., or Unau (*Bradypus* or *Cholœpus didactylus*), is about two ft. in length, of uniform grayish-brown color, often with reddish tint. The best-known species of Three-toed S. is the Ai (*Bradypus* or *Acheus tridactylus*), which is smaller than the Unau, has a more obtuse muzzle, and is generally brownish gray, slightly variegated with hairs of different tints, the head darker than the body. All the sloths belong to tropical America.

SLOUCH, n. *slowch* [Icel. *slakr*, slack; *slókr*, a dull, inactive person: Sw. *sloka*, to droop: Dan. *sluköret*, crestfallen—*lit.*, having hanging ears]: a hanging down; a depression of the head or other part of the body; an ungainly clownish gait: V. to cause to hang down, as a hat; to hang down; to have a downcast clownish look or manner. Slouch'ing, imp.: Adj. hanging down; walking heavily and awkwardly. Slouched, pp. *slowcht:* Adj. made to hang down; depressed. Slouch-hat, a limp hat with large brim. Slouch-shoes, large easy shoes.

SLOUGH, n. *slow* [Gael. *sloc*, a pit, gutter, grave: Dut. *slocken;* Gael. *sluig*, to swallow, to engulf: Gael. *slugaid*, a deep miry place]: a deep muddy place in which one may be engulfed; a soft bog or marsh. Sloughy, a. *slow'ĭ*, boggy; miry.

SLOUGH, n. *slŭf* [Norw. *slo*, a covering: Icel. *slög*, what is thrown away in dressing fish: Dut. *sloof*, a husk]: the cast-off skin of a serpent or similar reptile; simply a serpent's skin; the dead structure of flesh that separates from a wound, or during mortification: V. to separate from the living parts of flesh in a sore; to peel or fall off. Slough'ing, imp. Sloughed, pp. *slŭft.* Sloughy, a. *slŭf'ĭ*, resembling the dead matter which separates from flesh. To slough off, to separate from the living parts, as the dead part in mortification.

SLOUGH, *slow:* village and urban sanitary dist. in the county of Buckingham, England; 18 m. w. of London, by the Great Western railway; about 2 m. from Windsor; area 410 acres. On the road between S. and Windsor lived Sir William Herschel, and at the observatory which he erected here, in which was placed his great telescope, many of his important astronomical discoveries were made.—Pop. (1871) 4,509; (1881) 5,080; (1891) 5,427.

SLOVAKIAN, a. *slō-văk'ĭ-an* [Slavonian, *slovak*]: of or belonging to the Slovaks or their language: N. the language of the Slovaks. It is still spoken in parts of Moravia and Bohemia.

SLOVAKS, *slō-văks':* Slavic inhabitants of n. Hungary, who, in the 9th c., formed the nucleus of the great Moravian kingdom; but after the bloody battle of Presburg (907) were gradually subjugated by the Magyars, to whom even yet they bear no friendly feeling. The S., probably the closest representatives of the old Slavic type, are industrious; are of soft, pliant disposition; and are mostly Rom. Catholics. They travel in great numbers over Germany and Poland as pedlers. Their language is generally considered to present an earlier form of Czech or Bohemian. Against the competition of the Magyar, German, Czech, and Moravian, the Slovak tongue has been unable to establish itself as a literary language. The S. have produced some poets of note—e.g., Holly, Sladkovié, Chalupka: a collection of their popular ballads, etc., was pub. by Schafarik at Pesth, 2 vols. 1823–27.—The S. number about 1,950,000.—See Slavs.

SLOVAN, n. *slō'van* [etym. doubt.]: in *mining,* a gallery in a mine; a day level, especially applied to damp places.

SLOVEN, n. *slŭv'ĕn* [O. Dut. *slof,* an old slipper, a sloven: Ger. *schlaff,* slack, flagging: Low Ger. *sluf,* indolent, negligent: Swiss, *schluffen,* to lead an inactive thoughtless life]: a man negligent of cleanliness and neatness in dress; a man who is habitually careless of neatness and order—Slut being the corresponding feminine term. Slov'enly, a. *-lĭ,* untidy; wanting in neatness and order of dress: Ad. in a careless manner. Slov'enliness, n. *-nĕs,* negligence of dress; habitual want of order and neatness. Slov'enry, n. *-ĕn-rĭ,* in *OE.,* want of neatness.

SLOVENES, *slō-vĕnz',* or Slovenians, *slō-vē'nĭ-anz:* branch of the same s. Slavonic stock to which Serbs and Croats belong; found mainly in Styria, Carinthia, Carniola, and adjoining parts of s. Austria. They are sometimes called *Winds* or *Wends,* though distinct from the Wends (q.v.) of n. and e. Germany. The language of the S., *Slovenish,* is allied to Servian, but exhibits an older form of Slavonic. The Bible was printed in Slovenish 1584. The S. number about 1,300,000.—See Slavs.

SLOW, a. *slō* [AS. *slaw,* lazy, slow: Dut. *sleeuw, slee* blunt, ineffective: Bav. *schlew,* feeble: Icel. *sljór;* Dan. *slöv;* Sw. *slö,* blunt, dull]: not quick in motion; less speedy than usual, or than what might be expected; gradual; forbearing; not ready or prompt, as in speech; dilatory; inactive; dull, as in understanding; stupid; not lively; behind in time, as a clock: V. to slacken in speed; in *OE.,* to delay; to procrastinate. Slow'ly, ad. *-lĭ,* not speedily; not soon; not early; not hastily; gradually; not readily; tardily. Slow'ness, n. *-nĕs,* the state or quality of being slow; want of speed or quick motion; want of readiness or promptness. Slow coach, *familiarly,* one who gets on but slowly; a dawdling inactive person.—Syn. of 'slow, a.': inert; sluggish; dilatory; late; lingering; tardy; dull; inactive.

SLOW-MATCH: combustible material, such as cotton, hemp, tow, etc., often dipped in a solution of nitrate of potash (saltpetre), and formed into a thin rope. It is used for exploding gunpowder in various ways, on account of its slow, steady way of burning—a sufficient length being taken to enable the operator to remove to a safe distance. It is no longer used for firing cannon.

SLOWS, n. plu. *slōz:* a disease prevalent in some of the western and southern states; milk-sickness.

SLOW-WORM n. *slō-wėrm* [AS. *slá-wyrm*, probably not from *slow*, from its motion; but from AS. *slean*, to smite—from its supposed venomous sting: also referred to Ger. *schleichen*, to creep, or Norw. *slöge*, from its slime]: the blind-worm, a small reptile, snake-like but not venomous.

SLOYD. see Sloid.

SLUBBER, v. *slŭb'bėr* [Dut. *slobberen;* Dan. *slubbre*, to sup up liquids: Low Ger. *slubbern*, to sup up liquids, to do a thing carelessly and superficially]: to do lazily and coarsely; to stain; to daub; to sully; to cover coarsely or carelessly. Slub'bering, imp.: Adj. moving with hurry; acting imperfectly. Slub'bered, pp. *-bėrd.* To slubber over, to do a thing carelessly and superficially.

SLUB'BING: see Spinning.

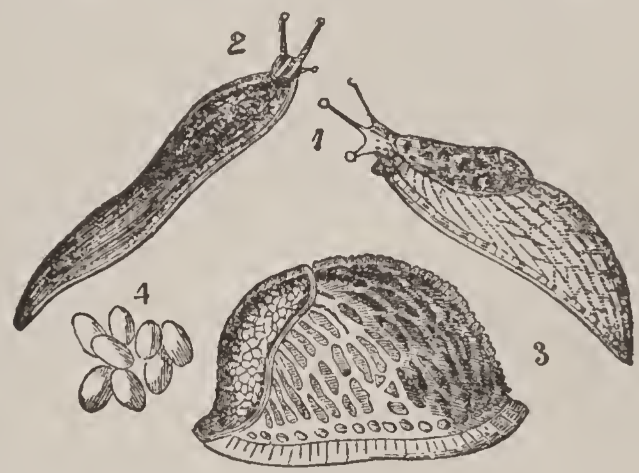
SLUD, n. *slŭd* [an abbreviation of *sludge*]: in *mining*, a term given to the water and mud mixed together which runs off in washing some minerals.

SLUDGE, n. *slŭj* [an imitative word (see Slush)]: soft mud; dirt mixed with water; mire; slush. Sludg'er, n. *-ėr*, an instr. for boring in sludge or quicksand. Sludg'y, a. *-ĭ*, miry; slushy. Sludge-hole, the mud-hole in boilers of steam-engines by means of which the sediment can be removed.

SLUE, v.: see Slew 2.

SLUG, n. *slŭg* [Low Ger. *slukkern*, to shake to and fro; *slakk*, slack, loose: Dan. *slugöret*, having flagging ears: Icel. *slókr*, a dull inactive person: Lith. *slunkis*, a sluggard]: one who indulges in sloth; a slow, sleepy, lazy fellow; kind of snail without a shell, very destructive to plants (see below): an oval piece of metal used for the charge of a gun: in the plu. Slugs, *slŭgz*, half-roasted ore: V. in *OE.*, to lie idle; to move slowly; to play the drone. Slug'ging, imp. Slugged, pp. *slŭgd.* Slug'gard, n. *-gėrd*, a person habitually lazy: Adj. lazy. Slug'gish, a. *-gĭsh*, idle; lazy; naturally given to indolence; having little or no power to move itself. Slug'gishly, ad. *-lĭ*, lazily; slothfully. Slug'gishness, n. *-nĕs*, the state of being sluggish; natural or habitual indolence; want of power to move; slowness. Slug-a-bed, one fond of lying long in bed; a late riser. Slug'gardize, v. *-dīz*, to make dronish or idle. Slug'gardizing, imp. Slug'gardized, pp. *-găr-dīzd.*—Syn. of 'sluggish': inactive; tardy; inert; idle; lazy; slothful; dronish; indolent; drowsy; dull; slow; stupid; tame.

SLUG: gasteropodous mollusk, of families *Limacidæ* and *Arionidæ*, which are closely allied to the Snail family, *Helicidæ*, but have no external shell. There is, however, a rudimental shell, generally concealed within the mantle, placed over the respiratory cavity. The *Limacidæ* are diffused over the whole world. They commit great ravages among field and garden crops during moist weather. In frosts, they become dormant, taking shelter under clods and at the roots of plants. They lay eggs in clusters, in moist places, often at the roots of grass. The eggs resemble small oval bags of jelly. The body is generally oval or oblong, elongated. The foot is not distinct from the body. There are four retractile tentacles; the eyes are at the tips of the longer pair. Slugs often climb trees in quest of decaying vegetable matter on which to feed; and let themselves down by means of mucous threads, for whose formation there is a small aperture at the hinder end of the body. Of British species, one of the most common is the Gray S. (*Limax agrestis*), of whitish ash color; another is the Great Gray S. (*L. maximus* or *antiquorum*), largest British species; another is the Black S. (*L. ater*), often popularly called the Black Snail. The Red S. (*Agrion agrestis*) also is very plentiful. Careful gardeners often gather slugs by the aid of a lantern at night, and destroy them. They may be killed also by watering the ground with a weak solution of ammonia.—For the American species, see works by W. G. Binney, published by the Smithsonian Institution. One of the two huge Ariolimax of the Pacific coast (*A. Californicus*) was found alive in Iowa, by H. W. Parker, having been transported on cabbages brought from California. The large southern species has of late, 1890–1, been encountered in and around New York.—The name S. is applied also to some grubs and caterpillars; also to certain sea-animals.



Slugs.

1, Gray slug; 2, Black slug; 3, The same full-grown, and as it appears when at rest; 4, Its eggs.

SLUICE, n. *slôs* [Sw. *sluss;* Dut. *sluys;* Ger. *schleuse;* Swiss, *kluss;* F. *écluse*, a flood-gate: Dan. *sluse*, a lock in a canal: mid. L. *exclūsa*, a flood-gate—from L. *exclūsus*, shut off—from *ex*, off; *claudo*, I shut]: a gate for the purpose of excluding or regulating the flow of water in a river, a canal, etc.; a source of supply; that through which anything flows: V. to open, as a flood-gate; to overwhelm; to wet abundantly; to emit by flood-gates. Sluic'ing, imp. Sluiced, pp. *slôst.* Sluicy, a. *slôs'ĭ*, falling in streams as from a sluice.

SLUM, n. *slŭm*, usually in plu. Slums, *slŭmz* [connected with Scot. *slump*, a marsh; as a verb, to sink in a mire or bog]: the low neighborhood or back streets of a city, containing a poor, degraded, and often vicious population: temporary sleeping-places for vagrants.

SLUMBER, v. *slŭm'bėr* [Ger. *schlummern;* Dut. *sluimeren*, to slumber: n. Eng. *sloom* or *slaum*, a gentle sleep or slumber: Sw. *slumra*, to slumber; *slumrig*, indolent, lazy]: to sleep lightly; to doze; to be in a state of supineness or inactivity; in *OE.*, to lay to sleep; to stun: N. light sleep; sleep not deep or sound; repose. Slum'bering, imp.: N. state of repose. Slum'bered, pp. *-bėrd.* Slum'berer, n. *-bėr-ėr*, one who slumbers. Slum'beringly, ad. *-lĭ.* Slum'berous, a. *-ŭs*, or Slum'brous, a. *-brŭs*, inviting or causing sleep. Slum'bery, a. *-bėr-ĭ*, in *OE.*, slumberous.

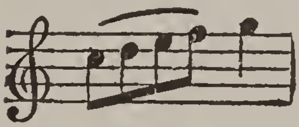
SLUMP, v. *slŭmp* [Low Ger. *slump*, a chance: Dan. *slumpe*, to light, to stumble: Scot. *slump*, a marsh]: to fall suddenly down into any wet or dirty place. Slump'ing, imp. Slumped, pp. *slŭmpt.*

SLUMP, n. *slŭmp* [Dan. *slump*, a lot: Sw. *slumpa*, to buy things in block]: the gross total: V. to throw things together into a single lot or mass. In the slump, in the gross amount. A slump sum, a sum named without giving detailed particulars and values.

SLUNG, v. *slŭng:* see under Sling.

SLUNK, v. *slŭngk:* see under Slink.

SLUR, v. *slėr* [O. Dut. *slooren*, to trail along the ground, as a loose hanging garment: Swiss, *schlargg*, a spot of dirt: Low Ger. *sluren*, to hang loosely: Bav. *schlier*, mud: Norw. *slöre*, to sully]: to soil; to contaminate; to sully; to disgrace; to pass lightly; to do carelessly or imperfectly, with *over;* to sing in a gliding style; to run notes into each other: N. a mark or stain; slight reproach or disgrace. In *music*, a mark thus, ⁀, drawn over two or more notes *not* on the same degree, to indicate that these notes are to be played *legato*, or smoothly and fluently. In vocal music, a slur is placed over all the notes that are to be sung to the same syllable, unless where they are grouped together by a common line. A slur must be distinguished from a *tie*, which is a similar arch drawn over two notes on the same degree, and denoting that, instead of the two notes written, one is to be played of the length of both. Slur'ring, imp. Slurred, pp. *slėrd:* Adj., marked with a slur; performed in a smooth gliding style; done imperfectly. Slurredly, ad. *slėrd'lĭ.*



SLUSH, n. *slŭsh*, or Slosh, n. *slŏsh* [an imitative word: Sw. *slaska*, to dash or dabble; *slask*, dirty liquid: Bav. *schlotz*, mud or dirt]: a familiar term for wet mud or dirty liquid, as snow in a state of liquefaction; a greasy lubricating mixture; on *shipboard*, the grease of pork and beef skimmed from the ship's coppers, generally the cook's perquisite; a mixture of white lead and lime: V. to smear with slush or grease; to shower water over, as a ship's deck. Slush'ing, imp. Slushed, pp. *slŭsht.* Slushy, a. *slŭsh'ĭ*, consisting of soft mud or of melting snow.

SLUT, n. *slŭt* [Low Ger. *slatte*, anything that hangs loose and flagging: Dut. *slodde;* Dan. *slatte*, a negligent, slovenly woman: Norw. *slott*, an idler: comp. Gael. *slaodaire*, a lazy person]: an untidy, dirty woman; a term of slight contempt applied to a woman—the correlative of *sloven.* Slut'tery, n. *-tĕr-ĭ*, the practice of an uncleanly and untidy woman; dirtiness. Slut'tish, a. *-tĭsh*, careless of dress and neatness; dirty. Slut'tishly, ad. *-lĭ.* Slut'tishness, n. *-nĕs*, untidiness; dirtiness.

SLUTSK, *slŏtsk:* town of European Russia, govt. of Minsk, about 63 m. s. of the town of Minsk, near the source of the Lesser Slutch. Except its public buildings, the houses are of wood. It is a market for grain, flax, linseed, and timber. Pop. (1883) 19,006.

SLY, a. *slī* [Icel. *slægr*, crafty: Ger. *schlau;* Dan. *slug;* Low Ger. *slou*, cunning: Gael. *sliog*, sly, sneaking (see Sleight)]: cunning; artful; crafty; subtle; wily; clever in doing things secretly and escaping detection, usually implying meanness; in *OE.*, slight; thin; fine. Slyly, ad., or Slily, ad. *slī'lĭ*, with secret artifice; insidiously. Sly'ness, n., or Sli'ness, n. *-nĕs*, the state or quality of being sly; artfulness. On the sly, in a secret manner. Slyboots, a sly or waggish person.

SMACK, n. *smăk* [Dut. *smak*, noise made in eating; *smaken*, to taste: Ger. *schmatz*, a hearty kiss; *geschmack*, taste; *schmecken*, to taste: Dan. *smæk*, a smack: Pol. *smak*, taste, relish: AS. *smæccan;* Sw. *smaka*, to taste: Low Ger. *smakken*, to smack the lips]: a noise made with the tongue and lips in eating or drinking with relish; the noise made with the lips in kissing, or with the thong of a whip; a loud kiss; a blow or slap given with the flat of the hand; savor; a small quantity; taste; tincture or quality: V. to make a noise with the lips after eating or drinking, or in kissing; to be tinctured with any particular quality or flavor; to slap with the hand, as the face; to crack, as a whip. Smack'ing, imp.: N. a sharp quick noise, with the lips, etc.: Adj. making a sharp brisk sound. Smacked, pp. *smăkt.*

SMACK, n. *smăk* [Low Ger. *smakk;* Dut. *smak;* Dan. *smakke*, a light vessel: AS. *snakk;* Icel. *snekkja*, a small vessel]: generic term for small decked or half-decked vessels employed in the coasting and fishing trade. The majority of smacks are, however, rigged as cutters, sloops, or yawls. According to Wedgewood, the *m* in this word is a corruption of *n;* the Anglo-Saxon has *snakk*, a small vessel, and there is a corresponding form in the other Teutonic and Scandinavian tongues.

SMACKERING, n. *smăk'ėr-ĭng* [from SMACK 1]: a smacking of the jaws at thought of food; a longing for.

SMAL'CALD: see SCHMALKALD.

SMALL, a. *smawl* [Dut. *smal*, thin, narrow: Icel. *smár;* Goth. *smals;* Dan. *smaa;* Fris. *sma*, small: Gael. *smad*, a particle: OHG. *smahe*, small]: not great; slender; of little moment, weight, or importance; little in degree; soft; not loud; trifling: N. the small or narrow part of anything, as of the leg or back. SMALL'ISH, a. *-ĭsh*, somewhat small. SMALL'NESS, n. *-nĕs*, the quality or state of being small; little in size, quantity, or value. SMALL'Y, ad. *-ĭ*, in *OE.*, in little quantity; in low degree. SMALL-ARMS, warlike weapons, as rifles, pistols, etc., as distinguished from great guns or cannon; all weapons actually carried by a man (see the respective titles: FIREARMS: PISTOL: BAYONET: SWORD: LANCE: ETC.). SMALL-ARMS FACTORIES, ROYAL, establishments through which all small-arms of every kind are supplied to the British regular army, the militia, yeomanry, and volunteers. The headquarters are at Enfield (q.v.), where there is a vast manufactory; and at Birmingham is a considerable establishment for viewing the arms supplied by contractors. SMALL-BEER, an inferior kind of table-beer. SMALL-CLOTHES, the nether garments of men, as breeches or trousers. SMALL-COAL, coal separated from the larger parts. SMALL-CRAFT, vessels in general of a small size. SMALL-DEBTS' COURT, in *Scot.*, court for the recovery of debts of small amount; in England (see COUNTY COURTS): in the United States any court takes cognizance of any amount of debt, large or small; though on actions for sums under $50, recovery usually carries the costs with it only in a justice's court. SMALL-HAND, the kind of writing used in ordinary correspondence, as distinguished from text or large-hand. SMALL PICA, a kind of type used in printing. SMALLPOX, a loathsome eruptive skin disease, highly contagious (see below). SMALL-STUFF, spun yarn, and the smallest kinds of ropes. SMALL-TALK, prattle; gossip. SMALL-WARES, such textile articles as tapes, braids, bindings, fringes, etc. To SING SMALL, to speak humbly; to cease tall talk. THE SMALLS, in Oxford Univ., the *Little-go* or previous examination; the final examination for a degree is called the *Great-go* or GREATS.—SYN. of 'small, a.': little; minute; diminutive; feeble; unimportant; trivial; insignificant; paltry; mean; short; weak; fine; slender; gentle; petty; soft.

SMALLAGE, n. *smawl'āj* [AS. *smæl*, small; F. *ache*, parsley—from L. *apĭum*, parsley]: the celery, which see.

SMALLPOX.

SMALL'POX, or VARIOLA, *va-rī'ō-la:* one of the most formidable of the class of febrile diseases known as *Exanthemata* (q.v.). All cases of regular S. are divisible into three stages—(1) the initial or eruptive fever; (2) the progress and maturation of the specific eruption; (3) the decline. The *first stage* begins with rigors, followed by heat and dryness of the skin, quickened pulse, furred tongue, loss of appetite, pain in the pit of the stomach, with nausea, vomiting, headache, and often pains in the back and limbs. The violence of the pains in the back, and the obstinacy of the vomiting, are frequently well-marked and characteristic symptoms. In children, the disease is often ushered in by convulsions; while delirium sometimes attends its onset in adults. On the third day, minute red specks begin to come out first on the face, then on the neck and wrists and on the trunk of the body, and lastly on the lower extremities. The fever usually begins to subside as soon as the eruption appears, and by the beginning of the fifth day, when the eruption is generally completed, the fever has entirely disappeared. The *second stage* commences when the eruption is fully out. On the second or third day of the eruption, a little clear lymph is seen in each pimple, which has increased considerably in size since its first appearance, and which is thus converted into a *vesicle*. The vesicles gradually increase in breadth, and become converted into *pustules*, which are at first depressed in the centre, but by the fifth day of the eruption become turgid and hemispherical; the suppuration on the face being complete by about the eighth day from the beginning of the fever, and the same process rapidly following in the other parts of the body in the same order of succession in which the eruption originally appeared. The pustules then break, and scabs or crusts form over them, which usually fall off after four or five days. The number of pustules in any special case, and the severity of the disease, stand in a direct ratio to one another; for in the first place, the number of pustules indicates the quantity of the variolous poison reproduced in the blood; and, in the second place, it is also a direct measure of the extent to which the skin suffers inflammation. The progress of the pustules is usually accompanied with swelling of the skin of the face, with a painful sensation of heat and tension; the scalp is often swollen; soreness of the mouth and salivation usual supervene; and the patient exhales a peculiar and disagreeable odor. About the eighth or ninth day of the disease, a recurrence of the fever, known as 'the fever of maturation,' sets in with varying intensity, according to the number and arrangement of the pustules. When the pustules are numerous, they run together; when they are few, they keep separate. Hence the division of smallpox into the two great varieties *distinct* and *confluent*, or *variola discreta* and *variola confluens;* and this division is of the highest importance, because the distinct form of the disease, in which the pustules are isolated, is scarcely ever dangerous; while the confluent form, in which they coalesce, is never free from danger. The *third* or *declining stage* is, in the distinct variety, little else than a period of convalescence. About the 11th or 12th day, the pustules on the face become brown and dry at the top, or some of them break, and the fluid which oozes out solidifies into a yellowing crust; and from this time the process of *desiccation* goes on, the swelling of the face subsides, and at last only dry-scabs remain, which gradually fall off about the 14th day: three or four days later, the same process is completed over the whole body. The scabs are usually completely gone by the 21st day, leaving behind them blotches of reddish-brown color, which sometimes continue for months before they quite disappear; and some of the pustules, in consequence of ulceration of the true skin, leave pits, especially on the face, which remain through life. The period of scabbing is accompanied by various symptoms of improvement: the tongue becomes clean, the appetite returns, and by the time that the scabs have fallen off, the patient may be regarded as restored to health; so that the course of a case of distinct or discrete S. occupies about three weeks.

In the confluent form of the disease, the eruptive fever is more violent, the pain in the back is more severe, the vomiting more obstinate, and the eruption comes out earlier and less regularly than in the distinct variety. Moreover, the pustules do not fill so completely, nor are they of the normal yellow purulent hue, being whitish, brown, or even purple. But the most important difference between the two forms is in the *secondary fever*, which sets in when the pustules are mature. This fever, which is slightly marked in distinct S., is usually intense and highly dangerous in the confluent form; and it is at this period of the disease that death usually occurs. Statistics show that the 8th day of the eruption is the most perilous *day*, and the second week the most perilous *week*. The early occurrence of death—i.e., during the first week—denotes peculiar malignancy in the disease. During the second week, the disorder proves fatal chiefly in the way of apnœa, from some affection of the respiratory passages. After that period, the characters of asthenia commonly predominate, the patient sinks under some casual complication, or the powers of life are gradually worn out by so much irritation of the surface, and the amount of suppuration.

The above are the essential symptoms of S., both in the distinct and in the confluent form. This disease is, however, often accompanied by other symptoms, which we have space merely to name; e.g., sore throat (which often depends on pustules situated there), salivation, and (in the confluent form, during the secondary fever) erysipelatous inflammation, leading to formation of abscesses, glandular swellings, sloughing sores on the sacrum, etc. In pregnant women, the disease often causes abortion, which is usually followed by death. The dead child occasionally, but not often, is covered with pustules.

The *cause* of S. is universally conceded to be a specific contagion. This acts either through the air (it has been known to cross a river 1,500 ft. wide), or by contact with the skin, or by inoculation; and the disease may be caused by the dead body, even when it has not been touched. Opinions are divided as to the period at which the disease begins to be and ceases to be contagious. It is safest to maintain that it is capable of self-propagation as soon as the febrile symptoms have exhibited themselves. How soon the patient ceases to be dangerous, cannot be decided with accuracy; but the stability of the contageous principle may be inferred from the fact that clothing will retain it for months, and it is said for years, when confined. Like all the contagious exanthemata, S. appears in epidemic form, at irregular, and, to our ignorance, seemingly capricious intervals. After an extraordinary exemption, perhaps for years, a district is suddenly invaded by it, and suffers for a longer or shorter period; the disease then dies out, as it were, and does not reappear perhaps for years. Different epidemics vary very much in their severity, and sporadic cases are usually milder than cases when the disease is epidemic. Race has much to do with the severity of the disease; the constitution of the dark races, the Negro and the Red Indian, being singularly susceptible of the contagion, and exhibiting very little power of resisting the fatal tendency of the disease.

Of the means that have been employed for counteracting this disease, *Inoculaton* (q.v.) protected the individual, but increased rather than diminished the total number of deaths; while *Vaccination* (q.v.) has the advantage of protecting both the individual and the community. Although, in the great majority of cases, vaccination affords perfect protection against S., it very frequently happens that vaccinated persons, when exposed to the contagion, get the disease in a modified form, milder and shorter even than after inoculation, and therefore incomparably milder than in the natural form. The disorder occurring under these circumstances, has received the various names of *modified* or *post-vaccinal* S., or *varioloid*. In varioloid the forms are very various, but in all of them the initial fever is much milder, and the vesicles and pustules much fewer than in S.; the complications and after effects are rarely serious. The secondary fever seldom appears, and the specific odor of S. is always absent.

With regard to prognosis, it may be stated generally that S. is a very fatal, and was formerly an extremely destructive disease—one death occurring in every four cases. It is more fatal at the two extremes of life than in the intervening period, and, as has been already noticed, is especially dangerous in pregnancy. In olden times it was believed that the eruption was an effort of nature to get rid of the noxious matter; hence heating and stimulating measures were adopted with the view of promoting the eruption. To Sydenham (q.v.) belongs the credit of first recommending an entirely opposite or cooling mode of treatment.

In mild cases and in cases of varioloid, the physician has merely to guard the patient against hurtful influences, such as stimulating foods or drinks, too hot a room, or improper exposure to cold, and to prescribe cooling drinks during the fever, and occasional laxatives. In more severe cases, the fever may be combated by saline purgatives, prescribed so as to produce two or three liquid stools daily, and by free ventilation of the surface of the body. When the eruption is all out, if the pimples on the face are few and distinct, the danger may be regarded as over, and no further treatment is required. If, however, the disease assume a confluent form, wakefulness and restlessness are apt to come on about the eighth day, and the physician may resort to opiates. If the pustules are abnormally torpid in reaching their maturity, it may be expedient to administer strong broths, or even wine; and when the pustules are livid, and intermixed with Petechiæ (q.v.), bark and acids must be additionally ordered, though the patient is then often beyond the reach of help. During the secondary fever, the bowels must be kept gently open, and opiates should be prescribed once or twice each day. A more nourishing diet is now called for, and wine should be given if the pulse is very weak. The external itching is partly relieved by the opiates, but local applications also are employed: cold cream, or a mixture of equal parts of olive oil and lime-water, may be thus used with advantage. Special methods have been devised to prevent the pitting or seaming of the face, often a hideous permanent disfigurement. Some physicians have used with good results cold or tepid compresses of light weight constantly applied over the face and eyes: the water with which the compresses are wetted may be a weak solution of carbolic (2 per cent.) or boracic acid. Others recommend touching each distinct papula with silver nitrate; and in confluent S. the use of a wash, consisting of a strong solution of that salt. Many others methods have been proposed.

During the period of desquamation, an occasional warm bath may be prescribed with advantage; and the patient should always resort to this measure, as a precaution against carrying the contagion about with him, before again mingling in society.

The history of this remarkable disease is not clearly traceable farther back than the 6th c. of our era. China and India are regarded as the original home of S. The first mention of it in literature was by the Arabian historian Masudi, who tells of a visitation of S. among the Abyssinians besieging Mecca A.D. 570. The Syrian physician Aron (about 622) speaks of S. as a well-known disease; and Rhazes, Arabian physician early in 10th c., declares that S. was known to Galen. After the Crusades, it prevailed in most of the temperate countries of Europe, but did not reach the northern countries, Norway, Lapland, etc., till later. In 1517 it was carried from Europe to St. Domingo; and three years later, it reached Mexico, where it committed fearful devastations, and whence it spread with intense virulence throughout the new world. (According to Robertson, three millions and a half of people were destroyed in Mexico alone.) In 1707 it was introduced into Iceland, when more than a fourth part of the population fell victims to it; and it reached Greenland in 1733, almost depopulating the country. These facts illustrate a law that seems universally true, that a contagious disease is always most virulent on its introduction to a new scene of action.

SMALL'POX IN SHEEP (*Variola ovina*): disease resembling the smallpox in man; but a distinct disease, not communicable either by contagion or inoculation, to men or children, or even to dogs or goats. Although common on the continent of Europe, it was unknown in Britain till 1847, when it appeared in Norfolk and the eastern counties, and in the summer of 1862 in Wiltshire. Variolous sheep or infected skins appear in both cases to have imported the disease from abroad. About ten days after exposure to contagion, the infected sheep become feverish, have a muco-purulent nasal discharge, and a hot tender skin. The red pimples which first appear, in about three days become white, and afterward leave scabs or ulcers. The weakness is great; mortality varies from 25 to 90 per cent. Good food and nursing are the remedies. If separation of sick from sound do not immediately check the disease, the whole sound flock should be inoculated, producing a mild artificial form of the disease.

SMALLS, Robert: slave, naval capt., and congressman; b. Beaufort, S. C., 1839, Apr. 5. While a slave he was a ship-rigger at Charleston ten years; in 1861, while pilot of the steam-transport *Planter*, he ran the steamer out and delivered it to the Union blockading fleet, and was himself employed by the fleet as pilot. For his heroism in battle he was made capt. 1863, and commanded the *Planter* till the end of the war. After this, living in his native town, he was delegate to the S. C. constitutional convention 1868, state representative the same year, and state senator 1870 and 72; and mem. of congress 1884–88. He has been also maj.gen. of state militia. With no education, except such as he acquired without tuition, he has done honor to himself and his race.

SMALLWOOD, *smawl'wûd*, William: soldier: 1732–1792, Feb. 14; b. Prince George co., Md. Elected col. of the Md. battalion 1776, Jan. 2, he was with Washington in New York, July 10, with nine companies, and Aug. 20 in the battle of Brooklyn Heights lost nearly half his command. At White Plains S.'s command again bore the brunt of the fight, and the col. was wounded. Promoted brig.gen Oct. 23, he took part in the battle of Fort Washington Nov. 16, with severe loss: at Germantown the Md. line, still commanded by S., retrieved the field for the American arms 1777, Oct. 4. During that winter, while stationed at Wilmington, S. captured a British brig, and at Camden won new laurels by gallantry. Appointed maj.gen. 1780, Sep., he refused after the removal of Gates to serve under the command of Steuben, though the latter was his senior officer. He was chosen representative in congress 1785. and the same year was elected gov. of Md.

SMALT, n. *smawlt* [It. *smalto*, enamel, plaster of Paris, etc.: Ger. *schmelz*, enamel; *schmelzen*, to smelt]: a glass colored by Cobalt (q.v.), which, when finely ground, acquires a beautiful azure color—used in water-color painting as a pigment, and in printing upon earthenware: also the colored glass compositions used for making the tesseræ in mosaics. Smalto, n. *smawl'tō* [It.]: the minute regular squares of colored glass used in the modern Roman mosaic. Smal'tine, n. *-tĭn*, arsenide of cobalt, one of the most important ores of cobalt.

SMARAGD, n. *smăr'ăgd* [L. *smaragdus;* Gr. *smaragdos*, a transparent precious stone of a bright-green color, including the emerald, the beryl, the jasper, the malachite, etc.]: the emerald. Smaragdine, a. *smăr-ăg'dĭn*, pertaining to the emerald; resembling the emerald. Smarag'dite, n. *-dīt*, a peculiar laminated variety of augite or hornblende, of a bright or emerald green color. See Diallage.

SMART, a. *smârt* [Ger. *schmerz;* Sw. *smärta;* Dut; *smart*, pain, ache: Dan. *smerte*, pain]: pungent; severe; painful; keen; sharp; quick; brisk, as a breeze; acute-witty; lively; trim; dressed in a showy manner; clever; intelligent: N. pungent lively pain; a pricking pain, as from nettles; severe or pungent grief: V. to feel a lively pungent pain; to experience a pricking pain, as from nettles; to experience pain of mind, as to *smart* under an injury; to bear the evil consequences of anything; to be punished. Smart'ing, imp. Smart'ed, pp. Smart'ly, ad. *-lĭ*. Smart'ness, n. *-nĕs*, the quality of being smart or pungent; liveliness; poignancy; severity. Smart-money, money paid to relieve from some unpleasant engagement, particularly from military service (see Recruiting): in *mil.*, money allowed to soldiers and sailors for wounds and injuries received; in *law*, excessive damages. Smarten, v. *smârt'n*, to make smart; to trim and dress in a showy manner. Smartening, imp. *smârt'nĭng*. Smartened, pp. *smârt'nd*.—Syn. of 'smart, a.': active; lively; brisk; pungent; sharp; quick; vigorous; acute; witty; vivacious; keen; tart; dashy; showy; clever.

SMART, *smârt*, Benjamin Humphrey: grammarian: about 1785–1865; b. England. He was teacher of elocution in London, and published numerous works on Eng. grammar, and on elocution; also on rhetoric, logic, and metaphysics. The work by which he is remembered is his *Pronouncing Dictionary* (first ed. 1836).

SMART'WEED: see Polygoneæ.

SMASH, v. *smăsh* [Sw. *smask*, a crack, report: Gael. *smuais*, to break in pieces: Dan. *smaske*, to smack with the lips in eating]: to dash to pieces; to break in pieces by violence; to crush; in *slang*, to pass base coin: N. a breaking in pieces; utter destruction. Smash'ing, imp. Smashed, pp. *smăsht*. Smash'er, n. *-ėr*, one who or that which smashes; *familiarly*, anything decisive; a thing very large or extraordinary: in *slang*, one who makes or passes false coin.

SMATCH, v. *smăch* [Low Ger. *smaksen;* Ger. *schmatzen*, to smack in eating (see SMACK 1)]: in *OE.*, to smack; to have a taste: N. a taste; a tincture; a twang. SMATCH'ING, imp. SMATCHED, pp. *smăcht.*

SMATTER, v. *smăt'tėr* [Ger. *schmatzen;* Swiss, *schmatzern;* Norw. *smatta*, to smack with the tongue in eating: Fris. *smeïjtsen*, to taste, to try: comp. Dan. *snadre*, to jabber]: to have a slight taste; to have a superficial and imperfect knowledge; to talk superficially. SMAT'TERING, imp.: N. a slight or superficial knowledge. SMAT'TERER, n. *-ėr*, one having only a slight or superficial knowledge.

SMEAR, v. *smēr* [Dut. *smeren;* Ger. *schmieren*, to smear, to daub: AS. *smeru;* Icel. *smör*, grease, butter]: to overspread with greasy, fatty, or adhesive matter; to daub; to soil. SMEAR'ING, imp. SMEARED, pp. *smērd.* SMEAR'ER, n. *-ėr*, one who smears.

SMEATH, n. *smēth:* a sea-fowl, also called the SMEW.

SMEATON, *smē'ton*, JOHN: English civil engineer: 1724, June 8—1792, Oct. 28; b. Austhorpe, near Leeds. He was educated at the Leeds grammar school. At the age of 15 he had constructed a machine for rose-engine turning. About 1750 he removed to London to begin business as a mathematical instrument-maker; but we find him in the following year resuming his desultory experiments in mechanical invention, an 'odometer' for ships, a compass, and improvements in water and windmill-machinery being the chief products. His improvements on mill-work were found on trial to be of great value, increasing the effective force by one-third, and gained S. the Copley medal of the Royal Society 1759. In 1754 he visited the Netherlands, and inspected the embankments, canals, and other remarkable works. 1756, Aug., operations were began on Eddystone rock for building a stone light-house after his designs (see EDDYSTONE): the building was executed 1757, June—1759, Oct., and the lantern lighted Oct. 16. This work, then the greatest of it kind ever undertaken, gave S. a place at the summit of his profession, and remained for 120 years a monument of his engineering skill (see his *Narrative, etc.*). Yet he seems to have had little employment till 1777. Among his chief works were: construction of the greater portion of Ramsgate harbor (1774); laying out of the line, and superintendence of construction of the Forth and Clyde canal; excavation of most of it; rendering of the Calder (Yorkshire) navigable; erection of Spurn light-house, and of several important bridges in Scotland, and an immense amount of mill-machinery. In 1783, in declining health, he retired from active business, dying at Austhorpe of paralysis. His numerous professional Reports, pub. 1797 in three 4to vols., were regarded by his successors 'as a mine of wealth.' In all difficult or important engineering schemes before parliament, S.'s advice was invariably demanded, and almost always followed.—see Smiles, *Lives of the Engineers.*

SMECTITE, n. *smĕk'tīt* [Gr. *smēktris*, marl, fuller's earth—from *smēchō*, I wipe off]: a kind of fuller's earth, having a greasy feel.

SMEE, *smē*, ALFRED: surgeon: 1818–1877, Jan. 11; b. England. He became a member of the Coll. of Surgeons 1840; was chosen fellow of the Royal Soc., London, 1841; and was appointed surgeon of the Bank of England. He devised the present system of printing Bank of England notes. He made a thorough study of electricity, and invented the galvanic battery which bears his name. He wrote: *Electro-Metallurgy; Sources of Physical Science; Electro-Biology; The Potato Plant; Principles of the Human Mind.*

SMEGMA, n. *smĕg'mă* [L. *smegma;* Gr. *smēgma*, a detergent, soap—from *smēchō*, I wipe off]: the white substance often seen upon the skin of new-born infants. SMEGMATIC, a. *smĕg-măt'ĭk*, cleansing; of the nature of soap.

SMELL, n. *smĕl* [Low Ger. *smelen*, to burn slow with a strong-smelling smoke: Dut. *smeulen*, to burn or smoke in a hidden manner: Sw. *smolk;* Dan. *smul*, dust: the sense of the word seems originally to have been dust, smoke, then smell]: the faculty of perceiving by the organs of the nose certain qualities of bodies; one of the five senses; scent; odor (see NOSE): V to perceive by the nerves of the nose; to have a particular odor or scent; to exercise sagacity. SMELL'ING, imp.: N. the sense by which odors are perceived. SMELLED, pp. *smĕld*, or SMELT, pp. *smĕlt.* SMELL'ER, n. *-ér*, one who smells. SMELLING-BOTTLE, a bottle containing something to stimulate or refresh through the sense of smell. SMELLING-SALTS, a carbonate of ammonia. TO SMELL A RAT, *familiarly*, to suspect strongly. TO SMELL OUT, *familiarly*, to find out by superior sagacity. —SYN. of 'smell, n.': odor; fragrance; scent; perfume.

SMELLIE, *smĕl'lĭ*, WILLIAM: publisher and author: 1740–1795, June 24; b. Edinburgh. He learned the printers' art, and by private study acquired an education. He became editor of the *Scots Magazine* 1759, and the following year embarked in business as publisher. He was the projector, editor, in part author, and publisher of the original *Encyclopædia Britannica* (1765–71, 3 vols. 4to). He translated and published Buffon's *Natural History.* Among his numerous original works is *The Philosophy of Natural History* (2 vols.), many reissues of which have been made in the United States.

SMELT: pp. of SMELL, which see.

SMELT, v. *smĕlt* [Ger. *schmelzen;* O. Dut. *smelten*, to melt, to dissolve: Dan. *smelte*, to smelt]: to melt or fuse an ore for the purpose of separating the metal; to fuse a metal. SMELT'ING, imp.: N. the act or operation of fusing ores or metals. SMELT'ED, pp. SMELT'ER, n. *-ér*, one who smelts. SMELT'ERY, n. *-ĭ*, smelting-works.—See IRON: ELECTRIC SMELTING.

SMELT, n. *smĕlt* [AS. and Dan. *smelt*, a smelt: AS. *smæl*, small], (*Osmerus*): genus of the Salmon or Trout family (*Salmonidæ*), of which only a few species are known; differing from the salmon, trout, etc., in having long conical teeth on the jaws and tongue, and on the tip of the vomer, the rest of the vomer being destitute of teeth; two distinct rows of teeth on each palatine bone. The COMMON S. (*O. eperlanus*), called *Spirling* or *Sparling* in Scotland, and *Eperlan* in France, is a species scarcely distinct from *Osmerus viridescens*, the Amer. S., found on the n.e. coasts as far s. as the Hudson; the Amer. species has longer body, greener back, and smaller scales. The S. is 8 or 10 inches (rarely 12 inches) in length; the form is very trout-like—rather more slender—the tail larger in proportion, and more forked; lower jaw much longer than the upper. The scales are small; the back is whitish, tinged with green; the upper part of the sides shows bluish tints, the lower part of the sides and the belly are of bright silvery color. The S. has a peculiar, cucumber-like smell, and a delicious flavor, for which it is esteemed for the table, where it appears often as accompaniment of other fish. The S. is an inhabitant partly of fresh water, partly of the sea: it ascends rivers to no great distance from the sea in autumn, and descends in spring. Great numbers of smelts are taken in estuaries, and near the mouths of rivers, by small-meshed nets; also on the open sea-coast, chiefly on low, sandy shores. S. have been kept with success continually in fresh-water ponds, in which they not only throve well without loss of flavor, but propagated abundantly. On the s. coast of England, the name S. or SAND S. is given to the Atherine (q.v.).—Another British species, the Hebridean S. (*O. Hebridicus*), was first discovered near Rothesay in 1837, and described by Yarrel. It is so rare as to be unimportant.

SMELTING: see IRON.

SMERDIS, *smĕr'dĭs* (Persian, BARDIYA): son of Cyrus the Great, who died B.C. 529. He was murdered at the instigation of his brother Cambyses, after their father's death. Before the return of Cambyses from Egypt, a magian, Gaumata (Ionic, Gometes), announced himself as Smerdis, still living, seized the government, and was welcomed by the people. Cambyses in despair killed himself on the way, in Syria. Gaumata—the false S.—reigned, popular as a friend of the people, remitting severe taxes. He was slain by seven conspirators from princely families, B.C. 521—the leader, Darius, succeeding him.

SMEW, n. *smū*, or SMEE, n. *smē*, or SMEATH, n. *smēth* [unascertained], (*Mergellus albellus*): bird of the family *Anatidæ*, very nearly allied to the goosander and mergansers, but having a shorter bill. The whole length of the male is not quite 18 inches; of the female, not quite 15. The S. abounds on the n. coasts of Asia, and in parts of continental Europe.

SMIBERT, or SMYBERT, *smī'bėrt*, JOHN: painter: abt 1684–1752; b. Edinburgh. He studied painting in Italy. He accompanied the renowned Dean (afterward Bp.) Berkeley to America 1729, and settled in Boston. Among his most prized works are portraits of Bp. Berkeley and his family; Jonathan Edwards; Edmund Quincy, and other notable personages. The early American painters, Copley, Trumbull, and Allston, are reputed to have been largely influenced by the works of Smibert.

SMICKER, v. *smĭk'ėr* [Sw. *smeka*, to caress; *smickra*, to flatter: Icel. *smeykligr*, smooth, sweet]: in *OE.*, to look amorously upon: ADJ. amorous; wanton; gay. SMICK'ERING, imp.: ADJ. looking amorously upon: N. an affected smile or amorous look.

SMIDDY, n. *smĭd'dĭ:* a familiar corruption of *smithy*, the workshop of a blacksmith.

SMIFT, n *smĭft* [etym. doubt.]: in *mining*, a match of paper saturated with nitre or other combustible substance, for igniting a charge of powder; a fuse. Paper rubbed over with gunpowder and grease is also used by miners.

SMIGHT, v. *smīt:* OE. for SMITE.

SMILACEÆ, *smī-lā'sē-ē:* natural order of exogenous plants, ranked by Lindley in his class Dictyogens (q.v.), and consisting of herbaceous or half-shrubby plants, generally more or less climbing, with reticulated leaves, and bisexual or polygamous flowers, a 6-parted perianth, six stamens, a free 3-celled ovary, with cells one or many seeded, three stigmas, and a roundish berry. There are about 120 known species, mostly of the genus *Smilax* (q.v.) scattered over the globe, but most numerous in temperate and tropical Asia and America. The root-stocks (*rhizomes*) of many species yield Sarsaparilla (q.v.). But some species have fleshy tubers, particularly *Smilax China*, native of China and Japan, whose tubers are very large and nutritious food. *Smilax pseudo-China*, an Amer. species, has similar tubers.—The roots of *Rexburghia viridiflora*, after being boiled and soaked in lime-water, to remove their acridity, are preserved in syrup for food in the Eastern Peninsula and Malayan Island: the stems are sometimes 100 fathoms long.

SMILACINE, n. *smī'lă-sĭn* [Gr. *smilax* or *smilăka*, the herb bind-weed or rope-weed]: a white crystalline substance found in the root of sarsaparilla.

SMILAX, *smī'laks:* genus of plants of the family or tribe *Smilaceæ*, climbing or supported by a pair of tendrils on the stem of the 3–9-ribbed, mostly ovate leaves, and with small, diœcious flowers; the ovary is 1–6-celled, with as many spreading sessile stigmas, and the fruit a small berry. The common name is Greenbrier or Catbrier. The common Greenbrier, with blue-black berries (*S. rotundifolia*), also *S. Walteri*, N. J. and s., incline to be evergreens, especially southward. *S. glauca*, the leaves abruptly mucronate and glaucous beneath, and *S. tamnoides*, with leaves inclining to violin- or halberd-shape, have rigid prickles. The thin-leaved *S. hispida*, with long weak blackish prickles, and *S. pseudo-China*, are similar in appearance; but the latter has a tuberous root-stock used to fatten swine and to make beer, at the south. Of the southern narrow-leaved species, *S. lanceolata* has red berries, and *S. laurifolia* thick evergreen leaves and solitary stigmas. The Carrion-flower, *S. herbacea*, leaves 7–9 nerved, as well as *S. tamnifolia*, the latter with leaves 5-nerved and heart-halberd shaped, are herbaceous and without prickles. There are nearly 200 species known, some tropical species and one European, yielding commercial Sarsaparilla (q.v.)—our Wild Sarsparilla being of another family.—The so-called smilax of greenhouses, from the Cape of Good Hope, is of another genus (*Myrsiphyllum*) of the same family, if *Smilaceæ* is made a tribe of the Lily family, as of late it is by some authorities. Its leaves, set edgewise to the stem, are transformed branchlets, as shown by its near relative, the European *Ruscus*.

SMILE, v. *smīl* [Sw. *smila;* Dan. *smile;* OHG. *smielan*, to smile: Dut. *smuylen*, to smile: Skr. *smi*, to laugh]: to express pleasure, moderate joy, love, or kindness, by an expansion of the features of the face; opposite of *frown;* to look gay and joyous; to favor, with *on;* to express slight contempt by a movement of the features of the face; to sneer: N. a natural expansion of the features of the face, expressive of pleasure, moderate joy, etc.; favor; propitiousness; a look resembling a smile, but expressing scorn or contempt. SMI'LING, imp.: ADJ. looking joyous or gay; expressing pleasure or kindness. SMILED, pp. SMI'LINGLY, ad. with a look of pleasure. SMI'LER, n. one who smiles.

SMILES, *smīlz*, SAMUEL, LL.D.: author: b. Haddington, Scotland, 1812. He was in the practice of surgery at Leeds; became editor of a newspaper 1845; sec. of the Leeds and Thirsk railway, and subsequently of the Southeastern railway, resigning and devoting himself to literary pursuits 1866. Among his published books are: *Physical Education, or the Nature of Children* (1837); *History of Ireland and the Irish People under the Government of England* (1844); *Life of George Stephenson* (1857); *Self-Help, or Illustrations of Character and Conduct* (1859—of which the 55th 1,000 copies had been issued 1864); *Brief Biographies* (1860); *Workmen's Earnings and Strikes* (1861); *Lives of Engineers*, 4 vols. (1861–5); *Industrial Biographies* (1863); *The Huguenots, their Settlements, Churches, and Industries in England and Ireland* (1867); *Character* (1871); *The Huguenots in France after the Revocation, etc.* (1874); *Thrift* (1875); *Jasmin* (1892). His historical works are faithful, and his practical works have been very widely read.

SMILLIE, *smĭ'lĭ*, JAMES: engraver: 1807, Nov. 23—1885, Dec. 4; b. Edinburgh, Scotland. After apprenticeship in his art, his family removed to Quebec, where he attracted the attention of Lord Dalhousie, under whose patronage he practiced in London and Edinburgh, but settled in New York 1830. He soon became eminent as engraver of paintings, especially those of Weir, Cole, Durand, Cropsey, Kensett, Bierstadt, etc.—his large copies of Cole's *Voyage of Life* being prominent examples of his work. He was elected member of the National Acad. of Design 1851. After 1861, he applied himself more to bank-note engraving, of which he was early the chief expert. He died in Poughkeepsie.—His son, JAMES DAVID S., b. New York 1833, Jan. 16, was a superior engraver; but since 1864, has applied himself to painting in oil and water-colors, becoming an academician 1876; well known also as an etcher. He has been successful especially in atmospheric effects, and in some cattle landscapes—his subjects ranging from France to California.—A younger son of James S., GEORGE HENRY S., b. New York 1840, Dec. 29, is noted as artist alike in oil and water colors; and became a member of the National Acad. 1882. His landscapes include many coast scenes of New England. His wife is a successful artist in *genre* home subjects.

SMIRCH, v. *smėrch*, or SMURCH [Icel. *myrkr*, darkness; *myrka*, to darken: Russ. *mrachnie*, dark: connected with *smear* and *murky*]: to blacken; to dirty; to soil. SMIRCH'ING, imp. SMIRCHED, pp. *smėrcht.*

SMIRK, v. *smėrk* [O. Ger. *smieren;* Manx, *smooir*, to smile: AS. *smercian*, to smirk]: to smile affectedly or pertly; to look affectedly soft or kind: N. an affected suppressed smile. SMIRK'ING, imp.: ADJ. smiling affectedly or pertly. SMIRKED, pp. *smėrkt.*

SMIRKE, *smėrk*, Sir ROBERT: architect: 1780–1867, Apr. 18; b. Cheltenham, England. His design for the Covent Garden Theatre, London (1809), brought him into public notice, and thereafter he designed numerous public buildings. The most noted of his works in classic style are the Post-office, College of Physicians, King's College, British Museum. His two principal works in Gothic are the restorations of York Minster and the addition and improvements of the Inner Temple, London. He wrote *Specimens of Continental Achitecture.*

SMIRKE, SYDNEY: architect: b. England in the beginning of the 19th c.; d. 1877, Dec. 8; bro. of Sir ROBERT S. He won the gold medal of the Royal Acad. 1819, and thereafter attained distinguished position in his profession. He had a pronounced bias for the Italian style. His chief works are a Reformatory in the Isle of Wight, restoration of portions of Litchfield Cathedral and York Minster after the second fire), and of the Temple Chh., London. He was elected prof. in the Royal Acad. 1861.

SMIT, v.: for SMITTEN: see under SMITE.

SMITE, v. *smīt* [Low Ger. *smiten;* Ger. *schmeissen;* Dut. *smijten*, to strike: Sw. *smida*, to forge: Dan. *smide*, to fling: AS. *smitan*, to smite]: to strike, as with the hand or a weapon; to kill or destroy; to punish; to afflict; to chasten; to affect with any passion; to clash together. SMI'TING, imp. SMOTE, pt. *smōt*, did smite. SMITTEN, pp. *smĭt'n*, or SMIT, pp. *smĭt*, affected with; strongly imbued with. SMITER, n. *smī-tėr*, one who smites. To SMITE WITH THE TONGUE, in *Scrip.*, to reproach; to upbraid; to revile.—SYN. of 'smite': to strike; pierce; kill; destroy; afflict; chasten; blast; collide.

SMITH, n. *smĭth* [from SMITE, which see: Icel. *smidr*, an artificer; *smid*, art, workmanship; *smida*, to construct]: one who *smites* metal into shape; a worker of metal with the hammer; a worker in metals. SMITH'ERY, n. *-ėr-ĭ*, the workshop of a smith; the work done by a smith. SMITH'Y, n. *-ĭ*, the workshop of a smith. SMITH'ING, n. the act or art of working iron into its intended shape. BLACKSMITH, a worker in iron. WHITESMITH, a worker in tinned or galvanized iron; a tinsmith. GOLDSMITH, worker in articles of gold. SILVERSMITH, worker in articles of silver.

SMITH, ADAM, LL.D.: author of a book which has become a landmark in political economy: 1723, June 5—1790, July 17; b. Kirkcaldy, Fifeshire, Scotland. His family belonged to the respectable middle class; his father was comptroller of the customs at the port of Kirkcaldy, and his mother, Margaret Douglas, daughter of a small Fifeshire laird. His father died a short time before his birth, and he was the object of his widowed mother's affectionate and solicitous care. When he was three years old, the poor woman got a sad fright from a calamity hardly known at the present day—the child was stolen by gypsies; but he was tracked and recovered by his uncle. This was the only adventure in his quiet life. After the usual burgh-school education in Kirkcaldy, he was sent 1737 to the Univ. of Glasgow. He there secured an exhibition on the Snell foundation, which took him to Balliol College, Oxford: there he studied for seven years, gaining large acquirements and showing independence of thought. It is said that he was intended for the Anglican priesthood; if so, his own convictions crossed his friends' designs. He returned to Kirkcaldy, and lived for a while with his mother in seclusion and study. It was said to be his practice to stand ruminating, with his back to the fire, and his head leaning against the chimney-piece—and over an old fireplace in Kirkcaldy it used to be shown how he had thus worn a piece off the paint. In 1748 he came to Edinburgh, where unostentatiously he became one of the brilliant little circle of men of letters then rising to importance. In 1751 he got the chair of logic in the Univ. of Glasgow, which was changed a year afterward for that of moral philosophy. In 1759 appeared his *Theory of Moral Sentiments*, notable for its reference of the mental emotions to the one source of sympathy; a one-sided view which, though eloquently presented, has gained no place in philosophy. *The Dissertation on the Origin of Languages* was published with the later editions of this book. Both had great reputation in their day, and procured attention to his doctrines on political economy. In 1762, the Univ. of Glasgow gave him the degree Doctor of Laws. The next year he became 'governor' or travelling tutor to the young Duke of Buccleuch. He was already sedulously collecting materials for his great work. He was nearly a year in Paris, and in the circle of renowned wits and philosophers of the reign of Louis XV. In 1766 he returned to Kirkcaldy to live in the old house with his mother. This was the year of the appearance of the *Inquiry into the Nature and Causes of the Wealth of Nations.* If there was any living man to whose works he was indebted for the leading principles of this book, it was David Hume; and from him it had its first emphatic welcome: Hume wrote immediately on receiving it: 'EUGE BELLE.—DEAR MR. SMITH—I am much pleased with your performance; and the perusal of it has taken me from a state of great anxiety. It was a work of so much expectation by yourself, by your friends, and by the public, that I trembled for its appearance, but am now much relieved. Not but that the reading of it necessarily requires so much attention, and the public is disposed to give so little, that I shall still doubt, for some time, of its being at first very popular. But it has depth, and solidity, and acuteness, and is so much illustrated by curious facts, that it must at last take the public attention.' This was not destined to be exactly the literary history of this great work. Its startling doctrines, fine clear style, and abundant illustration from curious facts made an immediate impression; but counteracting influences arose when people saw how far the new doctrines went in playing havoc with old prejudices. The French Revolution set the British mind against everything that breathed of innovation. It was known that the younger Pitt participated at first in S.'s free-trade notions, but he had afterward, whether from permanent connection or temporary policy, to put himself in the foremost ranks of the enemies of innovation. It was not until long after the terrors of that epoch and the nervous vicissitudes of the war had passed over, that S.'s work had an opportunity to revolutionize the public mind on matters of trade and finance. It came up as leader of a great literary host, for expounders crowded in numbers round *The Wealth of Nations* as the text-book of sound economy. It is needless to enlarge on a book so well known and so much read. The only reproach brought against it is, that it is not systematic in its form, and that its nomenclature is not exact. But its author was not arranging the results of established knowledge—he was rather pulling down existing structures of ignorance and prejudice. Nor, indeed, have those who have since attempted to make an exact science out of political economy, practically vindicated the reproach that they have cast on him of being unmethodical. Whatever we may yet come to, very few portions indeed of political economy admit of being treated as exact science. It is too closely connected with human passions and energies, consequently with special results and changes, to be so treated; and the best books on the subject are still characterized by the discursiveness and mixed philosophy and fact of the *Wealth of Nations.* In 1778, S. was made a commissioner of customs. The effect of this was to bring him to Edinburgh, and increase his means for indulging in his favorite weakness, the collection of a fine library; for he was, as he called himself, a 'beau in his books.' He lost his worthy mother 1784. In 1787 he was chosen lord rector of Glasgow Univ.—S. was of a generous nature; open to new ideas, indeed tending to innovation; therefore naturally arguing in the interest of the British working-classes, and sharply criticising manufacturers and capitalists, and decrying 'politicians.' See his life by J. A. Farrer (Lond. 1880).

SMITH, ALEXANDER: British poet: 1830, Dec. 31—1867, Jan. 5; b. Kilmarnock, Ayrshire, Scotland. He received a fair English education, and passed from school into a Glasgow warehouse as a pattern designer. While following this occupation he began to write poetry. His first volume, the *Life Drama* (1853) created something like a furor in literary circles. A reaction, however, followed, and the author had scarcely found himself famous when he began to be censured. The faults of his book were obvious enough: every page showed immaturity, and its natural result, extravagance; while a rather narrow reading having made him passionately attached to a few modern poets, as Keats and Tennyson, their peculiar turns of expression reappeared in his verse, and gave color to the charge of plagiarism, which was pushed to an absurd length. But impartial critics were not slow to perceive a richness and originality of imagery that atoned for defects of taste and knowledge. In 1854 S. was appointed sec. to the Univ. of Edinburgh; and 1855, with Sydney Dobell (q.v.), produced a vol. of *Sonnets on the War*. He afterward wrote *City Poems* (1857), *Edwin of Deira* (1861), and several prose works, e.g., *Dreamthorp* (1863), *A Summer in Skye* (1865), and *Alfred Hagart's Household* (1865). S. was distinguished also as a writer in prose: his style being marked by picturesqueness, polish, and originality.

SMITH, ANDREW JACKSON: soldier: b. Bucks co., Penn., 1815, Apr. 28. Graduated at West Point 1838, he served on the frontier, attaining the rank of maj. 1861, and was col. of cav. the same year. He was chief of cav. in Mo. 1861–2; brig.gen. of vols. 1862, participating in the battle of Corinth, the Yazoo expedition, the taking of Arkansas Post, the Vicksburg siege and capture of Fort De Russy (commanding a division on both occasions), and the Red river expedition. He was promoted lieut.-col. in the regular army 1864, and maj.gen. of vols.; had part in clearing Mo. of insurgents, and in pursuing Hood in Tenn. In 1865, he was promoted brig.gen. and maj. gen. in the U. S. army; commanded a corps in taking Mobile; and was chief of the dept. of Mo. 1867–8, resigning 1869. He was afterward postmaster at St. Louis.

SMITH, ASA DODGE, D D., LL.D.: Presbyterian pastor, and pres. of Dartmouth Coll.: 1804, Sep. 21—1877, Aug. 16; b. Amherst, N. H. He graduated at Dartmouth 1830, and at Andover Theol. Seminary 1834; was principal of Limerick Acad., Me., 1830–1; and pastor of the 14th St. Presb. Church, New York, 1834–63, where his scholarship and fine extemporaneous power, first exhibited in college, made him widely known; and he was prominent in benevolent, religious, and other public enterprises. In 1863 he succeeded Dr. Lord as pres. of Dartmouth, where he died in office.—Among his many publications, mostly addresses, are: *Letters to a Young Student* (1832); *Memoir of Mrs. L. A. Leavitt* (1843); *Importance of a Scriptural Ministry* (1848); *Discourse on the Life of Rev. James Hall* (1854); *The Puritan Churches* (1858); *Home Missions and Slavery* (1857); and sermons on *Christian Stewardship, Beneficence our Life Work, Obedience to Human Law, Death Abolished,* and *Abuses of the Imagination.*

SMITH, BENJAMIN BOSWORTH, S.T.D., LL.D.: 1794, June 13—1884, May 21; b. Bristol, R. I.: Prot. Episc. bp. He graduated at Brown Univ.; and though of Congl. parentage, entered the Prot. Episc. ministry; officiated as priest at Marblehead, Mass., 1818-20; afterward as rector of St. George's, Accomack co., Va.; Zion Church, Charleston, Va.; St. Stephen's, Middlebury, Vt.; Grace Mission Church, Philadelphia; and Christ Church, Lexington, Ky., where he was elected bp., and became presiding bishop. While in Middlebury, he edited the *Episc. Register;* and in Philadelphia, the *Episc. Recorder.* He published *Five Charges to the Clergy; Saturday Evening, or Thoughts on the Progress of the Plan of Salvation* (1876); and *Apostolic Succession* (1877).

SMITH, CHARLES FERGUSON: soldier: 1805-62; b. Penn. He was a graduate of West Point Milit. Acad.; served in the war with Mexico; in the civil war attained the rank of maj gen. For a time he was in command of the national forces in Ky. He took part in the investment of Fort Donelson and in the repulse of the Confederate sally.

SMITH, CHARLES HENRY: soldier: b. Hollis, York co., Me., 1827, Nov. 1. He entered the volunteer milit. service 1861 as capt. in the 1st Me. cavalry regt. He was appointed maj. 1862, col. 1863, and commanded his regt. at Upperville, Gettysburg, and through the movement of the Army of the Potomac to the Rapidan. He served in Sheridan's cavalry campaign 1864, May and June, and was brevetted brig.gen. of vols. for gallantry. From 1864, Oct. till the surrender of Lee, he commanded a brigade under Gen. David M. Gregg. He was successively brevetted maj.gen. of volunteers, brig.gen. U. S. army, and maj.gen. U. S. army. He became col. of the 28th infantry U. S. army 1866, and was transferred to the 19th infantry 1869.

SMITH, COTTON MATHER: 1731, Oct. 26—1806, Nov. 27; b. Suffield, Conn.: Congl. minister. His mother was granddaughter of Increase Mather, and his father a descendant of Henry S., first pastor at Wethersfield, who came to America 1636. Graduated at Yale 1751, S. studied theol. with Jonathan Edwards, assisting him as a teacher of the Stockbridge Indians 1751-53, after which he was pastor at Sharon, Conn. until his death. In 1775-6 he acted as chaplain to the troops of the n. parts of the colony of N. Y. Of the 4,000 sermons that he is said to have written, he published three (1770-93). His reputation was high as a scholar, a preacher, and a man of independent thought and winning character.—See Sprague's *Annals*, I.

SMITH, Edmund Kirby: Confederate general: 1824, May 24—1893, Mar. 28. He graduated at West Point 1845, he was promoted for gallantry in the Mexican war; was asst. prof. of math. at West Point 1849–52; cav. capt. in frontier service 1855, becoming maj. 1861. At the beginning of the civil war, he entered the Confederate service as lieut.col. of cav.; brig.gen. and maj.gen. 1861, lieut.gen. 1862, and gen. 1864; was wounded at Bull Run; commander in Ky., e. Tenn., n. Ga., and w. N. C. 1862, defeating the Union force at Richmond, Ky.; and of the trans-Mississippi dept. 1863, where he showed much ability in organizing govt. and industries. He defeated Gen. Banks 1864. He was pres. of the Atlantic and Pacific Telegraph Co. 1866–68; of the Univ. of Nashville 1870–75; and thereafter prof. of math. in the Univ. of the South.

SMITH, Edward Parmelee: 1827, June 3—1876, June 15; b. South Britain, Conn.: Congl. minister, and executive in benevolence. He graduated at Yale 1849; taught in Mobile, Ala., 3 years; graduated at Union Theol. Seminary, New York, 1855; was pastor of the Congl. church at Pepperell, Mass., 1856–62; supt. of the Christian Commission at the west, in the civil war, 1863–65; field sec. of the Amer. Missionary Assoc. 1866–7; U. S. agent of Indian affairs in Minnesota 1873; and pres. of Howard Univ. at Washington 1873–76.—He published *Incidents of the U. S. Christian Commission* (1869).

SMITH, Eli, D.D.: missionary and Arabic scholar: 1801, Sep. 13—1857, Jan. 11; b. Northford, Conn. He graduated at Yale 1821, at Andover Theol. Seminary 1826, and the same year went to Malta to superintend the American Board's printing-office there, and visited Beirut to study Arabic 1827–8. Afterward he was missionary to Syria and made Beirut his headquarters 1833; prepared molds for improved Arabic type (modelled after a fine MS. of the Koran) at the Tauchnitz establishment at Leipzig 1839; visited the United States 1841; and with Prof. Edward Robinson explored Palestine 1852. He died at Beirut.—He published, with Dr. Dwight, *Missionary Researches in Armenia*, 2 vols. (1833). In 1846 he began his great work of translating the Bible into Arabic, for 60 millions of people; and had completed the New Test., the Pentateuch, and much of the Prophets, when he died. The work was finished by Dr. Cornelius Van Dyke (1866–7).

SMITH, Francis Hopkinson: artist, author, and civil engineer: 1838, Oct. 23— ————; b. Baltimore, Md. His engineering work has been chiefly in connection with U. S. govt. contracts. His artistic and literary life has been mainly in New York. He paints principally in water-color, among his best pictures being *In the Darkling Wood* and *A January Thaw.* His literary style is light but refined and entertaining. Among his publications are *Well-Worn Roads* (1886); *A White Umbrella in Mexico* (1889); *Colonel Carter of Cartersville* (1891); *A Book of the Tile Club* (1887); *A Day at Laguerre's* (1892); and *Tom Grogan* (1895).

SMITH, George: Assyriologist: 1840–76, Aug. 19, b. Chelsea, England. His interest in Assyrian inscriptions was awakened first while examining paper casts of Assyrian monuments in the British Museum; and thenceforward he applied himself to Assyriology. His first notable feat was the deciphering an inscription of Shalmaneser II. recording the war against Hazael. He was one of the editors of a vol. on *Cuneiform Inscriptions of W. Asia*, 1867. Among the noteworthy cuneiform inscriptions deciphered by him prior to 1873 were: a tablet recording the solar eclipse of B.C. 763, June 15; memorials of the Israelitish kings Azariah, Pekah, and Hoshea; notices of the conquest of Babylonia by the Elamites, B.C. 2280; a religious calendar; an account of the Noachian deluge (later found to be one of 12 tablets containing the history of an unknown hero). He visited the site of Nineveh 1873, again 1874, and brought back more than 3,000 inscribed tablets, some entire, others in fragments. Again he set out for Nineveh 1876; but being detained in Syria, he discovered the ruins of Carchemish, cap. of the anc. Hittites: study of these ruins led him to infer a Hittite origin of the Etruscans; but this view is not accepted by antiquarians. S. died at Aleppo. He wrote an account of his *Explorations in Assyria; The Chaldæan Account of Genesis; Ancient History of Assyria.*

SMITH, Gerrit: 1797, Mar. 6—1874, Dec. 28; b. Utica, N. Y.: capitalist, orator, and reformer; son of Peter S., who acquired an immense landed estate. He graduated at Hamilton Coll. 1818; and was known first as active in promoting African colonization, but joined the anti-slavery movement 1835. He organized an anti-rum-shop party 1842. In 1848 he began to give away 200,000 acres of land in small parcels to the poor, including many negroes. A representative in congress 1852, he retired after brief service. In 1858, he was candidate for gov. as abolitionist and prohibitionist. He gave much aid to freedom in Kan., and to John Brown; and was temporarily insane after Brown's sad affair at Harper's Ferry, to which, however, he was not privy. During the civil war, he gave largely to the Union cause; but, satisfied with the results of the war, joined Cornelius Vanderbilt and Horace Greeley in liberating Jefferson Davis on bail. In a 'union church,' built by himself at his home in Peterboro, N. Y., he preached as an independent layman—his opinions returning to substantial orthodoxy in his later years. He was a man of great geniality and benevolence, remarkable voice, and impressive presence and oratory. Among his publications were: *Speeches in Congress* (1855); *Sermons and Speeches* (1861); *The Religion of Reason* (1864); *Speeches and Letters* (1865); *Nature the Base of a Free Theology* (1867); *Correspondence with Albert Barnes* (1868), and *The Theologies.* He is said to have given away $8,000,000 of property to objects of benevolence during his life. He died in New York.

SMITH, Goldwin, D.C.L., LL.D.: English publicist, educator, and reformer: b. Reading, 1823; son of a physician in Berkshire. He studied at Eton, and matriculated at Christ-Church, Oxford, but was soon elected to a demyship at Magdalen. His undergraduate career was one of unusual brilliancy; he gained both univ. scholarships, the Latin verse, and the two prize essays. In 1847, he was elected fellow of Univ. College, where he acted as tutor. In the same year he was called to the bar at Lincoln's Inn. He was appointed on the Oxford commissions to reconstruct the antiquated statutes of the university; also on the Popular Education Commission 1858. He was prof. of modern history in Oxford 1858–68. In 1868 he was elected to the chair of English and constitutional history in Cornell Univ., Ithaca, N. Y., and remained there till 1871 when he was appointed a member of the senate of the Univ. of Toronto, where he has since resided. Goldwin S. has long been known as a publicist of the highest class, and has completely identified himself with the more advanced school of reformers. During the civil war in the United States he was an earnest defender of Federal interests; and combated with success, in the *Daily News* (London) and elsewhere, the absurd theories of the rights of slavery and the duties of neutrals, then in vogue in Britain, and having also some advocacy even in the northern states of the Amer. Union. He also denounced the Jamaica massacres. S.'s writings are characterized by extent and accuracy of information, by a style vigorous and condensed, and by great powers of sarcasm. Among his principal publications are: *Irish History and Character; Two Lectures on the Study of History, with a Supplementary Lecture on the Doctrine of Historical Progress; The Empire*, reprint from the *Daily News* of 1862–3; *England and America*, lecture before the Boston Fraternity, reprinted from the *Atlantic Monthly; A Plea for the Abolition of Tests at Oxford; Rational Religion and the Objections of the Bampton Lecture in* 1858; several pamphlets on the American question; contributions to Oxford Essays; *A Short History of England;* etc. He is author of some of the most admired compositions in the *Anthologia Oxoniensis.* He received the degree LL.D. from Brown Univ., and D.C.L. from Oxford 1882.

SMITH, Green Clay: lawyer: b. Ky., 1830. He was educated in Transylvania Univ., served as volunteer in the Mexican war, and in the Federal army in the civil war, attaining the rank of brig gen. of vols. Later he was representative in congress, and gov. of Montana Terr. In the convention that nominated Abraham Lincoln for the presidency the second time, S. lacked only one vote of being nominated for the vice-presidency. Later he became a Bapt. minister, and prof. of law in the Ky. Milit. Institute. He d. in Washington, June 29, 1895.

SMITH, Henry Boynton, D.D., LL.D.: scholar and theologian: 1815, Nov. 21—1876, Feb. 7; b. Portland, Me. He graduated at Bowdoin Coll. 1834, was tutor there, and studied at Andover and Bangor theol. seminaries; and in Germany, at Halle and Berlin. While pastor at West Amesbury, Mass., 1842–47, he was also for two years prof. of Hebrew at Andover Theol. Seminary. From 1847 he was for three years prof. of mental and moral philos. at Amherst Coll.: from 1850 five years prof. of church hist. in Union Theol Seminary, New York; then, till 1873, prof. of systematic theol., resigning on account of ill health, but continued as emeritus prof. of apologetics till his death. As moderator of the New School Presb. Assembly 1863, mem. of committee on reunion, himself preparing a doctrinal basis, and preaching and publishing on the subject, he contributed much to the reunion of the New and Old School branches in 1871. He made an able report on the state of religion in the United States, to the Evangelical Alliance at Amsterdam 1867; founded the *Amer. Theol. Review*, and edited it 1859–62, and after it was united with the *Presb. Review* till 1871.—Among his published addresses are: *Relations of Faith and Philosophy* (1849): *The Nature and Worth of the Science of Church History* (1851). *The Problem of the Philosophy of History* (1851); *The Idea of Christian Theology as a System* (1857); and *The Reformed Churches of Europe and America in Relation to Church History.* His laborious and useful work, the *History of the Church of Christ in Chronological Tables*, 4 vols., was pub. 1859. He revised Davidson and Hall's translation of Gieseler's *Text-book of Church Hist.*, himself translating most of vols. IV. and V.; revised, also Hagenbach's *Hist. of Doctrine* and Stier's *Words of the Lord Jesus.* Articles on Calvin and leading German metaphysicians were contributed by him to Appletons' Amer. Cyc. With Prof. R. D. Hitchcock he wrote a life of Prof. Edward Robinson, and was preparing a life of Anson G. Phelps in his last days. He was a man of spiritual earnestness, of great mental candor and comprehensive scope of thought, presenting Christian truth in lines richly suggestive and with a style clear, vivid, and impressive.

SMITH, Henry Preserved, D.D.: clergyman: 1847, Oct. 23— ————; b. Troy, O. He graduated at Amherst 1869, and at Lane Theol. Sem., Cincinnati, O., 1872; studied in Berlin Univ. 1873–74, and in Leipsic Univ. 1876–7; was instructor in Lane Theol. Sem. 1874–76, and was appointed prof. of Hebrew and Old Test. exegesis there 1877. Charges of heretical teaching were brought against him 1892 in the Presbytery of Cincinnati, and his trial began Nov. 14, the charges and specifications being grounded on a published work of his entitled *Biblical Scholarship and Interpretation.* A vote on the charges was reached Dec. 12, when S. was found guilty of teaching that the Holy Scriptures were not absolutely without error, and of denying the assertion of the Confession of Faith regarding their inspiration. He was suspended from the Presb.

ministry until he should have made manifest to the Presbytery his renunciation of his errors, and his purpose no longer to propagate them.

SMITH, Isaac: 1736–1807, Aug. 29; b. Trenton, N. J. He graduated at the College of N. J. 1755; remained there as tutor; then studied medicine and practiced till the beginning of the revolutionary war; entered the army and attained the rank of col.; was judge of the N. J. supreme court 1783–1801, and member of congress 1795–97; was U. S. commissioner to make treaty with the Seneca Indians; and at the close of his life was a bank pres. in Trenton.

SMITH, James: signer of the Declaration of Independence: about 1720–1806, July 11; b. Ireland. He came to America and settled in Penn. 1729; was educated in Philadelphia; studied and practiced law and surveying, and engaged in iron-manufacturing; was active in ante-revolutionary movements; and raised the first vol. regt. in Penn. to oppose British oppression. He was a member of the Penn. convention 1775, of the provincial conference to organize a govt. for Penn. the same year; served in the continental congress 1775–78; and became a member of the gen. assembly of Penn. 1780.

SMITH, James and Horace: authors of *The Rejected Adresses:* James, 1775, Feb. 10—1839, Dec. 26; Horace, 1779, Dec. 31—1849, July 12; sons of an eminent London solicitor. James followed his father's profession, and succeeded him as solicitor to the board of ordnance; Horace adopted the profession of a stock-broker, and realized a handsome fortune, on which he retired with his family to Brighton. Both were popular and accomplished—James remarkable for his conversational powers and gayety; Horace (wealthier of the two) distinguished for liberality and benevolence. The work by which they are best known is a small volume of poetical parodies or imitations, perhaps the best in the language. On the opening of the new Drury Lane Theatre 1812, Oct., the committee of management advertised for an address to be spoken on the occasion; and the brothers S. adopted a suggestion, that they should write a series of supposed 'Rejected Addresses.' They accomplished their task in a few weeks—James furnishing imitations of Wordsworth, Southey, Coleridge, Crabbe, Cobbett, etc.; while Horace contributed imitations of Scott, Byron (all but the first stanza), Monk Lewis, Moore, and others. In talent, the authors were about equal; for though James had the greater number of successful imitations, the one by Horace of Scott is the most felicitous of the whole. None of the poets caricatured seem to have taken offense; and to Byron and Scott is ascribed the remark that they could scarcely believe that they had not written the addresses attributed to them. It is a curious fact in literary history that a work so exceedingly popular should have had great difficulty in finding a publisher; and that the copyright, originally offered to Murray for £20, and refused, was purchased by him 1819, after the book had run through 16 editions, for £131. The authors received more than £1,000 from the sale of the work. James was afterward an occasional contributor to periodical literature, and author of the humorous theatrical entertainments of Charles Mathews (for which he received £1,000). Horace wrote several novels—*Brambletye House, Tor Hill*, etc.

SMITH, James Lawrence, m.d.: chemist and mineralogist: 1818, Dec. 16—1883, Oct. 12; b. Charleston, S. C. He received a classical education at the Charleston Coll. and the Univ. of Va.; then studied medicine, after which he spent three years in Europe. He published (1841) an important original memoir on the detection of arsenic in the human body, and began the practice of medicine in Charleston, at the same time delivering lectures on toxicology. Incidentally he studied the marl-beds near Charleston, and the climatic and other conditions requisite for the growth of cotton. He went to Turkey 1846 to introduce there improved methods of cotton-culture, but soon was appointed by the sultan's govt. chief mining engineer. His services were of very great value to the govt.; his discoveries of ores, coal, and emery made a large permanent addition to the public revenue. He returned home 1851, and for three years was prof. of chemistry in the Univ. of Va.: and then

(1854–5) held a like chair in the Univ. of Louisville, Ky. He attended the Paris world's fair of 1867 and the Vienna world's fair of 1873, as one of the U. S. commissioners, on each occasion drawing up an elaborate official report on the progress of chemical industry. He made a special study of meteorites, and his collection of those bodies was scarcely equalled in America. He collected and republished his more important works (1873) under the title *Mineralogy and Chemistry, Original Researches.*

SMITH, Captain JOHN: English adventurer in Europe, Asia, and Africa, and founder of Va.: 1580–1631, June 21; b. Willoughby, Lincolnshire, England; son of a tenant farmer. He was a scholar in the free schools of Alford and Louth. The death of his parents, 1596, left him free to seek adventures abroad, regardless of the apprenticeship to a great merchant at King's Lynn to which he had been bound. He went through France until his money was spent, then became a soldier under Henry IV. of France, and later served in Holland. Thence he visited Scotland, and returning home shut himself up in a hermitage, where he studied Marcus Aurelius and Machiavelli's *Art of War.* Setting out again, to seek service against the Turks, he wandered across France from Picardy to Marseilles, and there took ship for Italy with pilgrims going to Rome, who cast him overboard, for a Jonah of heresy. Saving himself by swimming to an islet rock in the sea, he was picked up by a ship of Alexandria; and visited Egypt and the Levant. Returning, and having gone ashore in Italy, he went through Tuscany to Rome, saw Pope Clement VIII. at mass, wandered as far as Naples, and thence going north, through Tuscany and Venice, he came to Gratz in Styria. Here he got news of the Turks swarming through Hungary; and, at Vienna, enlisted under the emperor, for service in the wars 1601,2. After many adventures, a great battle (1602, Nov. 18, at Rothenthurm, a pass in Transylvania) left him wounded and a prisoner, to be sold for a slave at Constantinople. There a lady whose servant he became fell in love with him, and the pasha, her brother, made it the occasion of wantonly maltreating him, until S. knocked his brains out with a thresher's bat, and by riding many days through the desert escaped to a military post on the Don. Passing through Hungary and Austria, he came to Leipzig, 1603, Dec., and thence to England.

From 1605 S. was among the most ardent seekers of adventures in the new and strange America. After the failure of his plan to send a colony to S. America, he became one of the founders of the London Company for colonizing s. Va., and 1606, Dec. 19, sailed from London as one of the colony, whose course was first to the W. Indies, 1607, Mar. 24. Here some trouble caused S. to be tried for conspiracy, but he was released after the gallows had been set up for hanging him. The expedition sailed north, and, being caught in a gale, was blown into the mouth of Chesapeake Bay, and made land 1607, Apr. 26 Although S. was named, in the orders then opened, one of the council for govt. of the colony, he was kept under restraint 13 weeks in all, but on fully establishing his innocence was adjudged to be paid £200 as damages, and admitted to the council 1607, June 20; and till 1609, Oct. 4, when he finally left Va. for England, he was more than all others the staff of the colony. Extreme privations caused the death of 67 out of 105 colonists between 1607, June 22, and 1608, Jan. 8; and the winter after S. left the colony, all but 60 out of 490 perished in 'the starving time' 1609, Oct.—1610, Mar. The judgment and energy of S. in procuring food and keeping down disorder were mainly instrumental in saving the colony from the destruction which had overtaken those planted earlier by Sir Walter Raleigh. It was on an expedition to explore, and to secure corn, 1607, Dec. 10—1608, Jan., that S. first saw Pocahontas (q.v.), who became by marriage to a colonist one of the founders of Va. The great services of S. brought him to the presidency of the colony 1608, Sep. 10; and through the spring and summer of 1609 he administered affairs with remarkable success, both in subjecting the Indians and in getting supplies of food. But the arrival 1609, Aug. 11, of a new company of 500, sent out in June in nine ships, overthrew his authority, and brought great disorder, compelling him to return to England Oct. 4. The period 1610–17 he spent in discovery of the extended coast from Va. n. to Canada, at the same time fishing for cod and bartering for furs. At his solicitation, the long coast and regions behind it, known before as N. Va., received from Prince Charles the name New England; and to various points names were given, of which three adhered later—Plymouth, Charles River, and Cape Ann. In connection with two unsuccessful attempts to settle a colony, 1615 and 17, on the New England coast, S. was given the title Admiral of New England. He tried 1618 to secure the patronage of Lord Bacon, but without success; and 1619 he offered to lead the Pilgrim Fathers to New England, but was not accepted. S. died in London, and was buried in St. Sepulchre's Church.

The story and character of S. have been subjected to severe criticism by several American historians and scholars, some of whom have greatly discredited both; while the more judicious, as Palfrey and Tyler, though admitting, what can hardly be questioned, the untruth and extravagance of many portions of the story, come to a mostly favorable conclusion in regard to the man himself. Much that he wrote was retouched for the public, according to Mr. Palfrey's view, to improve the interest of the story, and, whether by others or by S. himself, it was after the manner of the times. The character of S. especially gains on scrutiny of all the evidence, and a large basis of fact underlies the marvels of his story.

Edward Arber's reprint of the *Works* of S. (Birmingham, Eng., 1884) fully represents the man and his writings. The separate titles and dates of the original publications were: *A True Relation of Va.*, 1608; *A Map of Va.*, 1612; *A Description of New England*, 1616; *New England's Trials*, 1620, 2d ed. 1622; *The General History of Va., New England, and the Summer Isles*, 1624; *An Accidence for all*

Young Seamen, 1626; the same recast as *A Sea Grammar*, 1627; *The True Travels, Adventures, and Observations of Captain John Smith, in Europe, Asia, Africa, and America, from 1593 to 1629*, 1630; and *Advertisements for the Unexperienced Planters of New England*, 1631. The *True Relation*, the *Description of New England*, and the *Advertisements* were reprinted in Boston 1865–6. At his death the indefatigable navigator and traveller was contemplating a *History of the Sea.*

SMITH, JOHN BLAIR, D.D.: 1756, June 12—1799, Aug. 22; b. Pequea, Penn.: coll. pres. and pulpit orator. Graduated at Princeton, he studied theol. under his brother, Dr. Samuel Stanhope S., whom he succeded as pres. of Hampden Sidney Coll. 1779. After a pastorate in the Third Presb. Church, Philadelphia, 1791–95, he became first pres. of Union Coll. 1795, returning four years later to his church in Philadelphia. He was grandfather of Maj. Gen. Charles F. Smith, notable in the civil war. His fame was great as a pulpit orator, but he published little besides a sermon, *The Enlargement of Christ's Kingdom* (1797).

SMITH, JOHN COTTON, D.D.: Protestant Episc. clergyman: 1826, Aug. 4—1882, Jan. 9; b. Andover, Mass.; son of Thomas M. S., pres. of Kenyon Coll.; grandson of Prof. Leonard Woods; great-grandson of Cotton Mather S. (q.v.), and descendant of John Cotton and Cotton Mather. He graduated at Bowdoin Coll. 1847; was rector in Bangor 1850–52; assistant at Trinity Church, Boston, 1852–59; and rector of the Church of the Ascension, New York, 1860–82. He was a noted preacher, and a leader in the liberal administration of the polity of his communion; prominent in religious and philanthropic enterprises, e.g., tenement-house reform; and was held in high regard in all denominations. He edited *Church and State.*—His publications include *Miscellanies, Old and New* (1876); Brier Hall *Lectures on Present Aspects of the Church* (1881); and many essays, on such subjects as the liturgy as a basis of union, the charity of truth, the church law of development, the Homeric age, the United States a nation, and evolution in its theistic bearings. He died in New York.

SMITH, JOHN COTTON, LL.D.: statesman: 1765, Feb. 12—1845, Dec. 7; b. Sharon, Conn.; son of Cotton Mather S. (q.v.). He graduated at Yale 1783, practiced law in his native place, was for some years member of the Conn. legislature, of which he was speaker 1800, after which he was in congress six years. In 1809 he became judge of the supreme court of Conn.; then lieut.gov.; and gov. 1813–18. In congress he was chairman of the committee of the whole in the debates at the beginning of the 19th c. relative to the federal judiciary. He was pres. of the Amer. Board of Missions and of the Amer. Bible Soc., and was known in many lines of benevolence.—See his *Correspondence and Miscellanies,* by W. W. Andrews (1847).

SMITH, **John Eugene**: soldier: b. Berne, Switzerland, 1816, Aug. 3. He removed to Philadelphia in early youth, received an academic education, and engaged in the jewelry business. In 1861 he entered the Union army as col. of the 45th Ill. inf.; 1862, Nov. 29, was promoted brig.gen. vols.; 1865, Jan. 12, brevetted maj.gen.; 1866, July 27, appointed col. 27th U. S. inf.; 1867, Mar. 2, brevetted maj.-gen. U. S. A.; 1870, Dec. 15, transferred to 15th inf., and Dec. 20 to 14th inf.; and 1881, May 19, was retired. He distinguished himself at Forts Henry and Donelson, Shiloh, Corinth, Vicksburg, Mission Ridge, and in the Atlanta and Carolina campaigns.

SMITH, **John Pye**, d.d., ll.d.: British Congl. minister and author: 1774, May 25—1851, Feb. 5; b. Sheffield, England. After a course at Rotherham Coll., he was prof. of theol. at Hamerton Coll. 1805–50. He attained high repute for learning, including science and German theol. thought, and incurred some odium at a time when natural science was regarded as tending toward infidelity.—He published *Scripture Testimony to the Messiah*, 2 vols. (1818–21); *The Sacrifice and Priesthood of Jesus Christ* (1828)—a defense of the evangelical view; *Scripture and Geology* (1839); and *First Lines of Christian Theology* (1854)—a syllabus of his class lectures, printed posthumously. A memoir of him was published 1853. He died at Guilford, Surrey.

SMITH, **Jonathan Bayard**: 1742, Feb. 21—1812, June 16; b. Philadelphia, Penn.: civil and milit. officer. He graduated at Princeton 1760; was sec. of the committee of safety 1775; member of the continental congress 1777–8; lieut.col. of a battalion 1777; justice of several courts 1778; auditor-gen. of Penn. 1794; trustee of the Univ. of Penn. from its foundation till his death. He was a high officer in the Sons of Washington and the Masonic fraternity.

SMITH, **Joseph**: 1790, Mar. 30—1877, Jan. 17; b. Boston, Mass.: rear-admiral. From midshipman in the navy 1809, he became 1st lieut. of the brig *Eagle*, and was wounded in the battle of Lake Champlain 1814; had part on the *Constellation* in the victory at Algiers, cruising in the Mediterranean mostly, 1815–45; was made commander 1827, capt. 1837, chief of the bureau of naval yards 1845–69, pres. of the examining board for promotions 1869–71. He was retired 1861, and appointed rear-admiral 1862. His record is one of ability and honor, as also that of his son, killed on the *Congress* by the attack of the *Merrimac* 1862.

SMITH, **Joseph**: see **Mormons**.

SMITH, **Joseph**, **Jr.**: head of the anti-polygamy branch of Latter-Day Saints or Mormons: b. Kirtland, O., 1832, Nov. 6; son of the prophet-founder Joseph S. (see **Mormons**). But 12 years of age when his father was murdered by a mob, he lived in Nauvoo, Ill., becoming a clerk, working on farms and railroads, and studying law. In 1860, having declined to recognize the existing Mormon Church, he led in a reorganization with a few followers, edited *The Saints' Herald at* Plano, Ill., made preaching tours, and settled at Lamoni, Decatur co., Io.; where he exercises chief authority in his 'Reorganized Church of the Latter-Day Saints,' which in 1900 had 600 churches and 45,500 mem., mostly in Ill., and had by its missionaries in Utah converted 10,000 Mormons to monogamy.

SMITH, JUNIUS, LL.D.: 1780, Oct. 2—1853, June 23; b. Plymouth, Mass.: first experimenter in Atlantic navigation by steam alone. Graduated at Yale 1802, he practiced law in New Haven; and in successful prosecution against the British govt. of a claim for capture of an Amer. ship, he became interested in commerce, in which he engaged. He first projected ocean steamships 1832 (a sail-and steam ship, Capt. Rogers, having crossed the Atlantic 1819); and he demonstrated their possibility by the voyage of the *Sirius* 1838. Failing to make his Brit. and Amer. Steam Navigation Co. profitable (organized 1836), he turned his attention to cultivating the tea-plant in S. C., but died in Astoria, N. Y., before his project was fulfilled.

SMITH, MELANCTON: naval officer: b. New York, 1810, May 24. He entered the U. S. navy as midshipman 1826; was commissioned lieut. 1837, commander 1855, capt. 1862, commodore 1866, and rear-admiral 1870; was chief of the bureau of equipment and recruiting 1866–70; and was retired 1871, May 24. During his naval career he was on sea service 19 years 2 months, shore or other duty 17 years, and was unemployed 28 years 8 months. His services during the civil war were especially brilliant at New Orleans, Fort Hudson, Fort Fisher, and off N. C. After his retirement he was gov. of the Naval Asylum at Philadelphia. He d. 1893, July 19.

SMITH, MORGAN LEWIS: 1822, Mar. 8—1874, Dec. 29; b. Oswego co., N. Y.: soldier. In 1846, while living in New Albany, Ind., he enlisted as a private in the U. S. army, and for bravery in Mexico was promoted sergt., soon afterward resigning and engaging in steamboat navigation. In 1861 he entered the Union army as col. of the 8th Mo. inf.; commanded a brigade at Fort Donelson and at Shiloh; was at Corinth, Russell House, Holly Springs, and Memphis; promoted brig.gen. vols. 1862, July; made commander of 2d div. of Sherman's army 1862, Nov.; wounded at Vicksburg Dec. 28; and was milit. gov. of Vicksburg after its fall. After the war he was U. S. consul at Honolulu, declined appointment as gov. of Colo., and engaged in business in Washington.

SMITH, PERSIFER FRAZER: 1798, Nov.—1858, May 17; b. Philadelphia; soldier. He graduated at the Coll. of N. J. 1815; studied law, removed to New Orleans, and became adjt.gen. of La. In the Seminole Indian campaigns in Fla. 1836 and 38 he was col. of La. vols.; at the outbreak of the Mexican war he was appointed col. of a rifle regt.; and during the war was brevetted brig.gen. and maj.gen. U. S. A. for gallantry at Monterey and at Churubusco and Contreras. In 1847 he was U. S. commissioner to arrange an armistice with Mexico, and was appointed civil and milit. gov. of Mexico city; 1848 was gov. of Vera Cruz; subsequently commanded the depts. of Cal. and Tex.; 1856 was promoted brig.gen. U. S. A.; and shortly before his death was assigned to command the Utah expedition.

SMITH, Richard: journalist; b. county Wexford, Ireland 1823, Jan. 30; of Scotch descent. His father died when S. was 17 years old. In 1841 S. emigrated, and settled in Cincinnati. For three years he worked as a carpenter, and then became reporter on the *Daily Chronicle;* 1849 he purchased and became editor of the *Price Current.* In 1854 he bought a controlling interest in the Cincinnati *Gazette,* which was consolidated 1880 with the Cincinnati *Commercial* as the *Commercial Gazette,* with S. as vice-pres. of the new company. He is still (1891) connected with it.

SMITH, Robert, d.d.: Prot. Episc. bishop: 1732, June 25—1801, Oct. 28; b. Norfolk co., England. He graduated at Cambridge 1753, and was elected a fellow of it; ordained deacon 1756, Mar. 7, priest 1756, Dec. 28; became rector St. Philip's Church, Charleston, S. C., 1759; served as a volunteer soldier in the revolution; pres. Charleston Coll. 1786-98; consecrated bishop of S. C. 1795. He died at Charleston.

SMITH, Robert Payne, d.d.: British orientalist: b. Gloucestershire, England, 1818. He graduated at Oxford 1841, receiving a Sanskrit and a Hebrew scholarship, and was appointed asst. librarian of the Bodleian. In 1865 he was made regius prof. of divinity, and 1871 dean of Canterbury. He is regarded as profound in oriental languages, including Arabic, and as a most erudite biblical commentator. He published an elaborate Latin catalogue of Syriac MSS, translated *Cyril of Alexandria's Commentary on St. Luke's Gospel; Ecclesiastical Hist. of John of Ephesus* (1860); *Thesaurus Syriacus* (1868-86); *Messianic Interpretation of the Prophecies of Isaiah* (1862); *Prophecy as a Preparation for Christ* (1869); and he contributed commentaries to various works—on Jeremiah to the Speaker's Bible; on Genesis to Bp. Ellicott's commentary; on Samuel to the Pulpit commentary; on Isaiah to that of the Soc. for Promotion of Christian Knowledge; and prepared a paragraphic Bible for the same soc. He was a mem. of the O. Test. revision committee.

SMITH, Samuel: 1752, July 27—1839, Apr. 22; b. Lancaster, Penn.: revolutionary soldier. He acquired a commercial education in his father's counting-room in Baltimore; was appointed capt. in Smallwood's Md. regt. 1776, Jan.; took part in the battles of Long Island, Harlem, and White Plains, and in the retreat through N. J.; was promoted maj. 1776, Dec., and lieut.col. 4th Md. regt. 1777; and was in the attack on Staten Island and at the battle of Brandywine. Placed by Washington in command of Fort Mifflin, he held the works under almost continuous fire from 1777, Sep. 26. till Nov. 11, when he was severely wounded. Congress voted him a sword and its thanks for his heroic defense. After Valley Forge and Monmouth,

S. resigned from the army, but was active in the Md. militia till the close of the war. Politically, he was a member of the Md. constitutional convention 1776; congress, 1793–1803 and 1816–22; U. S. senate 1803–15 and 1822–33; and mayor of Baltimore 1835–38. He was also maj.gen. of militia at the defense of Baltimore 1814.

SMITH, SAMUEL FRANCIS, D.D.: Baptist minister: b. Boston, Mass., 1808, Oct. 21. He graduated at Harvard, and studied theol. at Andover. He was pastor of Bapt. churches in Newton, Mass., and Waterville, Me., also prof. of modern languages in the Waterville Coll. (now Colby Univ.); and editor of the *Christian Review* and the *Baptist Missionary Magazine.* He published many songs and hymns, original and translated from the German, and contributed largely to the *Encyclopædia Americana.* He is author of the hymn for the nation, *My Country, 'tis of Thee;* and of *The Morning Light is Breaking.* He d. 1895, Nov. 16.

SMITH, SAMUEL STANHOPE, D.D., LL.D.: educator: 1750, March 16—1819, Aug. 21; b. Pequea, Lancaster co., Penn.; son of Robert S., D.D. A precocious student, he graduated at the Coll. of N. J. (Princeton) before he was 18 years of age: assisted in his father's school; and became tutor of classics and literature in the coll. of his graduation, meanwhile studying theology. Licensed to preach, he was missionary in western Va., where he originated Hampden Sidney Coll. Becoming prof. of moral philos. at Princeton 1779, he was chiefly instrumental in restoring the coll. from the ruins of war; and afterward, 1802, collected for it $100,000 in the south, having been its pres. 1794–1812. His fame as scholar, orator and philosopher, was high.—He published *Essay on Causes of Variety of Complexion and Figure of the Human Species* (1787); *Sermons* (1799); *Lectures on Evidences of the Christian Religion* (1809); *Lectures on Moral and Political Philosophy* (1812); *Principles of Natural and Revealed Religion* (1815). A memoir, with sermons, was printed 1821.

SMITH, SYDNEY: clergyman of the Church of England; celebrated wit and humorist; original projector of the *Edinburgh Review:* 1771, June 3—1845, Feb. 22; b. Woodford, Essex. His father was an eccentric English gentleman of moderate independence; his mother was grand-daughter of a French refugee; and Sydney, it was said, fairly represented both nations. He was educated at Winchester School and New College, Oxford; and wished to study for the legal profession, but found it necessary to take orders in the church, and became curate of Amesbury in Wiltshire. 'The squire of the parish,' he says, 'took a fancy to me, and requested me to go with his son to reside at the University of Weimar; before we got there, Germany became the seat of war, and, in stress of politics, we put into Edinburgh, where I remained five years.' During this time he officiated in the Episc. chapel there, and published *Six Sermons* 1800. In conjunction with a few accomplished literary associates—Jeffrey, Horner, Brougham, Dr. Thomas Brown, Playfair, etc.—S. started the *Edinburgh Review*, whose first number appeared 1802, Oct., constituting a new era in periodical literature, and in independent thought and criticism in Britain. In 1803 S. removed to London, and was soon popular as preacher, lecturer on moral philosophy (1804–06), and brilliant conversationist—the delight and wonder of society. As a preacher, S. was not at all 'sensational' or eccentric, though fresh and earnest. Church preferment, however, came slowly. In 1806, during the short reign of the whigs, he obtained from Lord Erskine, then lord chancellor, the rectory of Foston-le-Clay, Yorkshire; in this obscure rural parish, miles away from any educated neighbor, S. was cheerful and faithful in all his parochial duties—winning the hearts of the humble folk. About 18 years afterward the Duke of Devonshire gave him the living of Londesborough, worth £700 per annum, to hold until Mr. Howard, son of the Earl of Carlisle, came of age In 1828 Lord Chancellor Lyndhurst presented him to a prebendal stall in Bristol, and enabled him to exchange Foston for Combe Florey, a more desirable rectory in Somersetshire. In 1831 Earl Grey appointed him one of the canons residentiary of St. Paul's; and this completed his round of ecclesiastical preferments. He sighed for a mitre, but it never came; and Lord Melbourne is said to have regretted this omission in his career as prime minister S. accepted the disappointment of his expectations of a bishopric, which expectations his friends had raised, with all his characteristic good humor and cheerfulness. The writings of S. subsequent to 1800 were his contributions to the *Edinburgh Review*, which he collected and republished with other miscellaneous works 1839; *Peter Plymley's Letters*, written 1807, to promote Rom. Cath. emancipation, and abounding in wit and irony worthy of Swift; *Sermons* in two vols., 1809; *Speeches on the Catholic Claims and Reform Bill*, 1825–31; *Three Letters to Archdeacon Singleton on the Ecclesiastical Commission*, 1837–39; *The Ballot*, political pamphlet, 1837; *Letter to Lord John Russell on the Church Bills*, 1838; *Letters on Railways*, 1842; *Letters on American Debts*, 1843; etc. Though gay, exuberant, and witty to the last, S. suffered from periodical attacks of gout, and other ailments. Ten years after his death his daughter, wife of Sir Henry Holland, physician, published a memoir of her father, wtth a selection from his letters.

The works of S. were mostly on temporary topics and controversies, yet they will probably take a permanent place in literature as specimens of clear and vigorous reasoning, rich unctuous humor, and solid good sense. His jokes, exaggeration, and ridicule all are logical, driving home his argument; and his wit was sportive, untinctured with malice.

SMITH, William; called the Father of English Geology: 1769, Mar. 23—1839, Aug. 28; b. Oxfordshire. His profession of land-surveying led him to geological observation; and 1794 he began his map of the strata of England, and became the founder of stratigraphical science. His epoch-making Geological Map of England (see GEOLOGY) was pub. 1815. He published numerous other geological maps, received many honors, and died at Northampton.

SMITH, William, LL.D., D.C.L: British author of biblical and classical dictionaries: b. London 1813. He was educated in the London Univ., took first prizes in classics, and afterward abandoned law for ancient literature. In 1853 he was appointed classical examiner of the univ.; in 1869 a mem. of its senate; and 1867 became ed. of the *Quarterly Review*.—His valuable works are: *Dictionary of Greek and Roman Antiquities* (1840-42); *Dict. of Biography and Mythology* (1843-49); and *Dict. of Classical Geography* (1852-57)—the three forming an *Encyc. of Classical Antiquity*, followed by summaries of the same for school use (1850), and a smaller summary, *Dictionary of Classical Antiquity*. He prepared also a school series of histories namely, *History of Greece* (1853), and abridgment of Gibbon (1854)—these, with Hume abridged and Liddell's Rome, reprinted as Harper's student's series; a Latin-English Dict. (1855); *Dictionary of the Bible*, 3 vols. (1860-63); *Student's Latin Grammar* (1863); principias or readers in Latin and Greek; *A Copious and Critical English-Latin Dict.;* and a large atlas of *Biblical and Classical Geography*. He died Oct. 7, 1893.

SMITH, William Farrar: soldier: b. St. Albans, Vt., 1824, Feb. 17: known in the U. S. army as 'Baldy Smith.' Graduated at West Point 1845, he served as topographical engineer in the lake region and on the Mexican boundary, with intervals of duty at West Point as asst. prof. of math. 1846-48 and 1855-6. From 1856 for five years he was in the light-house construction service, and sec. of the board 1859-61, having been promoted capt. of topographical engineers 1859. After brief duty on the staff of Gen. B. F. Butler, 1861, he was col. of vols. in July; brig.gen. of vols. Aug., participating in Gen. McClellan's Va. campaign; brevetted lieut.col. in the regular army 1862; maj.gen. of vols. the same year, leading a division at South Mountain and Antietam; and brevetted col. U. S. army. As corps commander he fought at Fredericksburg, and was made maj. of engineers 1863. After other service, he distinguished himself at Chattanooga, especially in the movement he made at Brown's Ferry, 'saving the Army of the Cumberland.' Subsequently he had part in the Va. campaigns of 1864; was promoted brig.gen. U. S. army, and maj.gen.; resigning from the army 1867; after which he was pres. of the International Telegraph Co., police commissioner of New York, and pres. of the police board, and following his profession of civil engineer.

SMITH, William Henry, D.C.L.: 1825, June 24—1891, Oct. 6; b. London, England; son of the well-known publisher and news-dealer of the same name; received a grammar-school education; and became a partner in his father's firm. He entered political life 1865, when he was defeated for parliament in Westminster as a conservative. In 1868 he defeated John Stuart Mill, and held the seat till 1885; he was then returned for the Strand district, and re-elected 1886. He was financial sec. of the treas. 1874–77; first lord of the admiralty 1877–80; sec. of state for war 1885· chief sec. for Ireland six days, and again sec. of state for war 1886; and first lord of the treas., warden of the Cinque Ports, and govt. leader in the house of commons from 1886, Dec. 23, till his death. He received his hon. degree from Oxford Univ. 1879, and was universally esteemed.

SMITH, William Robertson, D.D., LL.D.: biblical and Arabic scholar: 1846, Nov. 8—1894, Mar. 31; b. Keig, Scotland. He was educated under private tutors, then at Aberdeen Univ., and at Bonn and Göttingen. Elected prof. of Hebrew in the Free Church (Presb.) Coll. at Aberdeen, he was removed from his chair by the gen. assembly 1881, in consequence of his 'higher criticism' of the O. Test. Scriptures, published in his articles contributed to the *Encyc. Brit.* (9th ed.), and in other writings. For some years following, he assisted in editing the new edition of that encyclopedia. Meanwhile he had been also asst. prof. of physics at Edinburgh 1868–70, and member of the Old Test. revision committee from 1872. In 1879–80 he journeyed in Arabia; and was made lord almoner prof. of Arabic at Cambridge Univ. 1883. He was appointed librarian of that univ. 1886, and Sir Thomas Adams prof. of Arabic 1889. The novelty and freedom of his criticisms, as those of a British writer in orthodox ranks, have called forth strong animadversion, and have made his name widely known. His ability as scholar and writer is universally recognized.—Among his principal writings are: *The Old Testament in the Jewish Church* (1880); *The Prophets of Israel, and their Place in History to the Close of the Eighth Century B.C.* (1882); *Kinship and Marriage in Early Arabia* (1885); *Lectures on the Religion of the Semites* (1889).

SMITH, William Stephens: 1755–1816, June 10; b. New York. He graduated at Princeton College 1774, studied law, entered the army, and became lieut.col., serving successively on the staffs of Sullivan, Steuben, and Washington. In 1785 he was sent as sec. of legation to London. He was surveyor of the port of New York, member of assembly three years, congressman 1813–16. He died at Lebanon, N.Y.

SMITH COLLEGE: institution for the higher education of women; at Northampton, Mass.; founded 1875, with an endowment fund of $400,000, by Miss Sophia Smith, of Hatfield, Mass., who proposed to provide by it for young women 'means and facilities for education equal to those which are afforded in our colleges for young men.' The charter obtained by the board of trustees appointed by the founder gave the institution full powers 'to grant such honorary testimonials, and to confer such honors, degrees, and diplomas, as are granted or conferred by any university, college, or seminary in the United States.' The design of fully equalling the best colleges for young men, and thus affording the broadest and highest intellectual culture for women, was carried out in the rigorous conditions of admission, on a level with those of Harvard and Yale, and in the curriculum of studies adopted. The chosen head of the college, L. Clark Seelye, D.D., to whom was intrusted the execution of the founder's plans, and who still remains the president (1891), was a Congregational minister of experience as an educator in Amherst College. His administration has been broadly undenominational and liberal.

There are three courses of study, each extending through four years. The classical leads to the degree B.A.; the scientific to B.S.; and the literary to B.L. In special cases any one of these courses may be extended to five years. The prescribed studies of all the courses are such as are deemed necessary to give them distinctive character and to secure unity and consecutiveness. The plan is meant to afford enough prescribed work to insure a high grade of scholarly culture, while elective studies are introduced to meet the demand of individual tastes. No student may take more work than will involve 16 hours of recitation a week. The amount which each is expected to take involves not less than 13 hours of recitation a week in the first and second years, and 12 in the third and fourth years. The studies in art and music are offered as electives in the academic courses, and they may be taken in any year. There are, also, special schools of music and of art. The school of music is in Music Hall, with ample accommodations for practice, lectures, and public performances. The regular course of study covers three years, and to those who complete it the degree Bachelor of Music is given. The school of art, for which Mr. Winthrop Hillyer provided the Hillyer Art Gallery and an endowment of $50,000 for perpetual increase of the art collection, has a regular course of study extending through four years. It furnishes practical and theoretical instruction in the principles of the arts of design—drawing, painting, and sculpture, including the elements of architectural styles and decoration.

For 1902 the total students numbered 1,017, professors and instructors 77; volumes in the library 7,500; scientific apparatus valued at $112,166; grounds and buildings $650,000; and productive fund $868,361.

The academic build. are: (1) College Hall, for lecture and recitation rooms; including Social Hall, reading-room, library, and offices for instructors; (2) Music Hall, with all the best modern appliances and facilities for work in vocal and instrumental music; (3) Hillyer Art Gallery, provided with studios and exhibition-rooms, and containing extensive collections of casts, engravings, and paintings, serving to teach the history and characteristics of ancient and modern art; (4) the Observatory, furnished with an equatorial telescope of 11 inches aperture, a spectroscope with diffraction grating, a sidereal clock, a chronograph, a portable telescope, and a meridian circle of four inches aperture; (5) Lilly Hall of Science, given by Alfred Theodore Lilly, at a cost of $60,000, and providing ample accommodation for the scientific work and collections—the first floor and basement containing lecture-room and laboratories for chemistry and physics, and the scientific library; the second floor having the biological and geological laboratories and class-rooms; and the collections occupying the whole third floor. A gymnasium-building, with dressing-rooms, bowling-alleys, and a hall arranged for exercise and indoor sports, has served until 1891. A new and larger gymnasium is now provided, with swimming-bath and Swedish apparatus. A specialist examines each student, and prescribes proper exercise.

A special feature, adopted at the organization of the institution, is that of commodious dwelling-houses, each with its own parlor, dining-room, and kitchen, as well as the ordinary students' rooms, in which a group of students, presided over by a lady, may form a family, in which intellectual discipline is combined with the culture of a refined home. The charge for board and furnished rooms in these college-houses is $250 a year; that for tuition of all students, regular, special, and graduate, is $100 a year. Religious culture, by daily worship, by attendance on Sunday at one of the churches of the town, by a systematic critical study of the Bible, and by the general influences of the institution, has been secured to a remarkable degree, with entire personal and intellectual freedom. The town chosen for the site of the college, and the situation secured for its buildings, combine advantages peculiarly favorable. Few American towns surpass it in natural attractions, or in the intelligence and refinement of its people, and the interest of its historical associations. In addition to a town library of more than 20,000 vols., with its permanent endowment fund of $50,000, a new library with 6,000 volumes has been provided for, with an endowment of over $300,000; and in the college buildings there are good reference-libraries for special student use. Aid is given to students otherwise unable to go through college by means of annual scholarships of $100 and $50 each; and four endowed scholarships are awarded.

SMITH'FIELD: noted cattle-market in London. In the 12th c. it was an open spot which served as a playground and place for a stroll. Being a little n. of Newgate, and w. of Aldersgate, it was outside the city walls. It was in S. that the rebel Wat Tyler met his death 1381. Several noted tournaments were held here; and the place is associated with trials by battle, burnings of martyrs, public executions during many centuries, and a variety of incidents connected with the history of the metropolis.

The most celebrated fair in England, Bartholomew Fair (q.v.), was always held in Smithfield.

A cattle-market was held in S. at least seven centuries ago, for Fitzstephen mentioned it 1150. The corporation had official control over the market more than 500 years dating from 1345; and the city authorities have never to this day relaxed their hold over the one only live-cattle market in the metropolis. At one time there was a project for removing the market to a field near Sadlers' Wells; at another, to a spot near the n. end of Gray's Inn Lane; while a spirited projector spent £100,000 in building a new market at Islington; but powerful influence prevented the removal of the cattle-market until 1855. The last market-day in the old spot was June 11 in that year; after which, the trade was transferred to the large and complete establishment built by the corporation at Pentonville. For several years after this, S. was practically useless. In 1860, however, the corporation obtained an act for erecting market-buildings on the site of S., and the first stone of a magnificent Dead-meat Market, from designs by Horace Jones, the city architect, was laid 1867, June. The building, formally opened 1868, Nov., is 636 ft. long by 246 broad, is traversed by numerous avenues, and has about 200 shops for dealers in meat. Under it, three railways deep below the ground-level traverse the area—one eastward to Aldersgate and Finsbury, one southward to Ludgate and Blackfriars, one n.-westward to King's Cross and the north of London. Near the middle of S. is a circular spiral road descending to an underground railway goods-station. The remainder is laid out in well-paved carriage and foot ways, with a small ornamental green or garden, including paths, seats, and a drinking-fountain. There is also a new market for poultry, butter, cheese, pork, etc.

SMITHSO'NIAN INSTITUTION: foundation at Washington, D. C., established for promotion of science. Its name 'Smithsonian' commemorates James Smithson (about 1765–1829, June 27), b. in England: natural son of the third Duke of Northumberland. Smithson was a student of science, in particular chemistry; friend and associate of the scientific notables of his time, and himself an original investigator. He died at Genoa, and by his testament bequeathed to the United States all his property for founding an institution 'for the increase and diffusion of knowledge among men.' The bequest amounted to about $550,000. The S. I. was established 1846. It occupies a large and imposing building, erected from the interest of the money bequeathed by the founder. It is governed by a board of regents, consisting of the U. S. chief-justice, *ex officio*, three U. S. senators appointed by the vice-pres. of the United States (these serve during their term of office as senators), three representatives in congress named by the speaker of the house of representatives (these serve two years), and six citizens named by joint resolution of congress; of these citizens, two must be residents of the Dist. of Columbia, and they all hold office six years. The regents choose one of their own number chancellor; they elect from outside the board a sec., who is also sec. and director of the S. I. The first sec. was Joseph Henry (q.v.); on his death, 1878, Spencer F. Baird was made sec., having been for 28 years assistant to Prof. Henry. Prof. Baird died 1887, and was succeeded by Samuel P. Langley. The S. I. is by law the depository of the national museum, or collection of scientific, historical, artistic, and other material accumulated at the seat of govt., exclusive of such material as naturally belongs to the several govt. offices—e.g., Patent Office, Land Office, archives of the state dept., etc. But in time it was found that the resources of the institution were inadequate for proper housing of the vast and rapidly growing collections. The art collections were therefore transferred to the Corcoran Gallery; the library, then comprising 75,000 vols., to the library of congress; and the herbarium and the entomological collection to the dept. of agriculture. The study of meteorological phenomena, long pursued at the S. I., became the province of the weather bureau of the signal service. Thus the S. I. is enabled to carry out more effectively the purpose of its founder 'to increase and diffuse knowledge.' The treasures of natural-history specimens and other strictly scientific material are retained in the Smithsonian building proper: in a separate building, under the control of the S. I , is the national museum, in which are stored the vast collections of objects of human art accumulated by the several geographical exploring expeditions and the geological survey. The S. I. is the authorized medium for exchange of scientific publications between scholars and learned bodies in the United States and those in other countries. Its own publications are: 1, *Smithsonian Contributions to Knowledge*, recording the results of original scientific research; 2, *Smithsonian Miscellaneous Collections*, comprising reports on the progress of science, reports on explorations, and other papers likely to be useful to scientific workers; 3, The *Annual Report of the S. I.*, which contains not only an account of the affairs of the institution during the year, but also a history of the progress of science during that period.

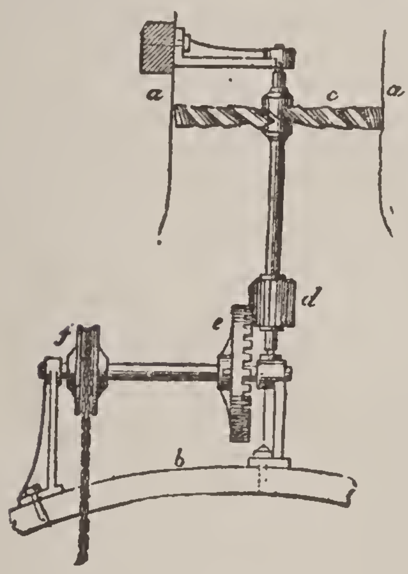
SMITHSONITE, n. *smĭth'sŏn-īt* [after the chemist James *Smithson*]: silicate of zinc, occurring in attached crystals, granular or in compact masses, and of various colors.

SMITT, n. *smĭt* [Ger. *schmitz*, a stain: AS. *smittian*, to spot (see also SMUT)]: very fine clayey iron ore, made into balls for marking sheep.

SMITTEN, v. *smĭt'n:* see under Smite.

SMOCK, n. *smŏk* [Icel. *smokkr*, a shirt without arms; *smokka*, to stick in: in Heligoland, *smock*, a woman's shirt: AS. *smoc*, a garment]: a woman's under-garment; a chemise. Smock-frock, n. *-frŏk*, a loose, coarse, linen garment, worn above the dress by English farm-laborers and others; a blouse.

SMOKE, n. *smōk* [AS. *smeac;* Ger. *schmauch;* Dut. *smook*, smoke: Gr. *smūchō*, I burn in a smouldering fire: Ir. *smuid*, smoke, fume: W. *mwg*, fume]: the cloudy fumes or vapor arising from any burning substance; anything resembling smoke, as vapor: V. to apply smoke to; to cure by hanging in smoke; to scent as by smoke; to inhale and emit the fumes of tobacco; to throw off in the form of smoke; to move with such swiftness as to smoke, as a horse; to steam; to reek; to expel by smoke; in *Scrip.*, to be kindled; to burn; in *OE.*, to suffer; to be punished. Smo'king, imp.: Adj. emitting smoke: N. the act of throwing off smoke; the act or habit of using tobacco by burning it in a pipe or in the form of a cigar, and inhaling its fumes. Smoked, pp. *smōkt*. Smo'ker, n. *-kėr*, one who smokes tobacco. Smoke'less, a. *-lĕs*, not throwing off any smoke. Smo'ky, a. *-kĭ*, throwing out smoke; filled with smoke. Smo'kily, ad. *-lĭ*. Smo'kiness, n. *-nĕs*, the state of being smoky. Smoke-balls, in *mil.*, hollow balls made of repeated folds of paper filled with a composition which gives out much smoke. Smoke-black, a sooty substance obtained from the combustion of certain resinous bodies, especially of pitch, used in the manufacture of printers' ink, of blacking for shoes, etc. Smoke-board, a sliding or suspended board before the upper part of a fireplace to cause an increased draught, and prevent smoke coming into the room. Smoke-consuming, a. applied to certain furnaces which consume their own smoke (see Smoke, Abatement of). Smoke dry, v. to dry by smoke. Smoke-dried, dried or cured by smoke. Smoke-jack, a contrivance to turn a spit before a fire by means of the current of ascending air in the chimney. Smoke-quartz, a mineral having a brownish smoke-colored tint, and comprising the wine-yellow and clove-brown crystals, which are the true cairngorms. Smoke-sail, a small sail to protect the funnel of a ship's galley from the wind. Smoking-room, a place set apart in a hotel or other building, or on a public conveyance, for smoking tobacco in. Smoke-stack, in a *steam-vessel* the group of flues rising above the deck, comprising the Funnels (q.v.), and the several escape-pipes for the steam which are beside it In ships of-war all these are frequently made 'telescopic,' that



Smoke-jack.

they may be drawn down out of danger in action or in a strong head-wind. TO END IN SMOKE, to become an utter failure; to fail in success after much show and parade.

SMOKE, v. *smōk* [Bav. *schmecken*, to snuff, to smell: AS. *smeagan*, to investigate: connected with SMOKE 1]: in *OE.*, to smell or hunt out; to discover anything meant to be kept secret; to detect; to find out; to expose; to ridicule. SMO'KING, imp. SMOKED, pp. *smōkt.*

SMOKE, ABATEMENT OF: consuming or straining of smoke from bituminous coal discharged from chimneys. Bituminous coal consists of carbon, generally about 80 per cent., hydrogen, nitrogen, oxygen, and sulphur, with a varying proportion of earthy impurity, or ash. When a fire is made, two distinct processes take place: first, destructive distillation, as in the retorts of gas-works; secondly, combustion of the products of distillation. The distillation decomposes the coal, whose elements become rearranged so as to yield: (1) hydrogen, marsh-gas, carbonic oxide, olefiant gas, benzine and similar hydrocarbons, and water—all gaseous or capable of being rendered gaseous at a higher temperature, and all, except the water, combustible; 2, ammonia and other nitrogen compounds, and certain sulphur compounds, also volatile and combustible; 3, coke, consisting of carbon and ash, combustible but non-volatile. It is these products of distillation that are burned, and this second process requires the presence of air, also a temperature much higher than is requisite for the first process. With perfect combustion the only products are water vapor, carbonic acid, nitrogen, and sulphurous acid; and the water vapor contains all the hydrogen originally present in the coals, the carbonic acid contains all the carbon, the sulphurous acid all the sulphur, while the nitrogen liberated represents not only all the nitrogen in the fuel, but also all the nitrogen of the air introduced to promote combustion: these products are discharged into the atmosphere through the chimney. To insure this complete combustion, two things are needed: adequate but not excessive supply of air, and a proper temperature. Because these conditions are very seldom perfectly fulfilled, the combustion of coal is usually imperfect, and the products of distillation enter the atmosphere unburnt or only partly burnt. Usually the name smoke is applied to this mixture of hydrogen, hydrocarbons, carbonic oxide, and unburnt carbon only when it contains a sufficient amount of finely divided carbon to render it dark-colored. Thus, besides the disfigurement of cities caused by the carbon, the smoke nuisance involves an enormous waste of fuel, and its abatement is a problem not less important on economic than on sanitary and æsthetic grounds.

The sanitary codes of modern cities usually contain ordinances prohibiting the pollution of the atmosphere by smoke. The sanitary code of New York city (sec. 118) has this: 'From and after the first day of June, 1870, every furnace employed in the working of engines by steam, or in any mill, factory, printing-house, dye-factory, iron-foundry, glass-house, distillery, brew-house, sugar-refinery, bake-house, gas-works, or in any other buildings used for the purpose of trade or manufacture, shall be so constructed as to consume or burn the smoke arising therefrom, unless a permit to the contrary be obtained from this department.' Similar regulations exist in other principal cities of the United States. In London the smoke-nuisance is punishable with fine. Many are the methods that have been employed for abatement of the smoke-nuisance and promoting economy in the combustion of coal. At Glasgow the proprietors of certain iron furnaces receive a rental from the 'Furnace Gas Co.' for the right to collect the smoke and gases from the blast-furnaces. These are passed through several miles of iron tubing, diminishing in size from 6 ft. down to 18 in., and as the gases cool there is deposited a considerable yield of oil. At the smallest iron-works in Glasgow, the Furnace Gas Co. pump and collect about 60,000,000 cubic ft. of furnace-gas daily, and recover about 25,000 gals. of furnace-oil a week, using the residual gases, consisting chiefly of carbonic oxide, as fuel for distilling and other purposes, while a considerable yield of sulphate of ammonia is also obtained. The oil is used for 'lucigen' lamps and in treating timber for railroad ties: it can be used also as an enricher of coal-gas. A simpler method of collecting the smoke and gases is described in the London *Engineer* (1891). The experimental apparatus employed consists of a fan which passes the combustion products from the fire of a portable engine into a chamber containing water. The products enter a horizontal perforated tube, partly immersed in water in this chamber and rotating at the rate of about 200 revolutions a minute. On this tube are arms carrying perforated sheet-iron, so that by the rotation of the tube and these arms the water is thrown up in fine spray, through which the smoke must pass on its way to an exit from the upper part of the chamber. Perforated plates are placed also in the upper part of this vessel, through which the escaping gases must pass, and which throw down the water. The high temperature of the products of combustion which enter this chamber causes evaporation of some of the water, which passes away as vapor at atmospheric pressure. The smoke is robbed of all carbonaceous material, and, to some extent, of other deleterious constituents, including sulphur. These collect in the water and form a scum, which is constantly drawn off. The cost of the process is low enough to commend the system and apparatus.

SMOKE'LESS GUN'POWDER: see **EXPLOSIVES.**

SMOKY: see under **SMOKE 1.**

SMOLENSK, *smō-lĕnsk':* govt. of European Russia, bounded e. by the govt. of Moscow and Kaluga; 21,638 sq. m. S., watered by the Dnieper, Dvina, Gshat, Oka, Iput, etc., is one of the most fertile provinces of the empire, and produces great quantities of corn, hemp, and flax. Extensive forests yield splendid timber and mast. The rearing of swine is on a great scale. Manufacturing industry and export trade are largely expanding. Pop. (1891) 1,412,162. (1897) 1,551,068.

SMOLENSK′: fortified town of Russia, cap. of the govt. of S; picturesquely situated on a range of steep declivities overlooking the river Dnieper, 250 m. w.s.w. of Moscow. It is one of the oldest towns in the empire, having been a place of note in the 9th c., is surrounded by massive walls (with 17 towers), and has three cathedrals, about 32 churches, and several monasteries, together with a diocesan seminary, a gymnasium, a milit. school for nobles, hospitals, etc. S. has manufactures of linens, soap, leather, and carpets, and considerable export trade in corn and flax. —S. is historically notable as the scene of a bloody repulse of the Russians under Barclay de Tolly and Prince Bagration, by Napoleon, 1812, Aug. 17, when on his march for Moscow.—Pop. (1882) 35,830; (1890) 37,741.

SMOLLETT, *smŏl′ĕt*, TOBIAS GEORGE, M.D.: British novelist: 1721–1771, Oct. 21; b. Dalquhurn, of an old and distinguished family in Dumbartonshire. His grandfather, Sir James S. of Bonhill, was one of the commissaries or consistorial judges of Edinburgh, and sat in the Scots parliament as representative of his native county. While he was very young his father died; leaving his family unprovided for; but young S. was well educated, and afterward apprenticed to a surgeon in Glasgow. He is said to have wished to enter the army, and, being disappointed, to have avenged himself on his grandfather, who thwarted his inclinations, by describing Sir James under the unamiable character of the old Judge in *Roderick Random.* This is related by Scott and all the biographers, but it must be a mistake; for Sir James, the grandfather, died 1731, when Tobias was only in his tenth year. The duty of attending to the education and settlement of the youth would naturally devolve on his widowed mother and on the Laird of Bonhill, his cousin. It is certain, however, that S. inherited no fortune; and in his 18th year, he went to London with a tragedy which he had written on the assassination of James I. of Scotland, and which he trusted would lead to distinction, if not wealth. He was grievously disappointed, and being reduced almost to starvation, was glad to accept the post of surgeon's-mate on board one of the ships in the unfortunate expedition to Carthagena, 1741. He soon quitted the service in disgust, though not before he had seen enough of naval life and character to be of inestimable value to him as a novelist; and returning to London, he entered on the profession of an author. He made, indeed, repeated attempts to obtain practice as a physician; and 1750, got a diploma of M.D. from Aberdeen (according to some authorities, from a German univ. 1752), but his hasty irritable temper and independent spirit, joined to his natural propensity to satire, prevented his success. Even his literary career was a ceaseless warfare. In 1748, in his 27th year, he produced *Roderick Random*, which found a great popular welcome, and seemed at once to place its author very near, if not in the actual rank of, Fielding as a novelist. In 1751, appeared *Peregrine Pickle*, a more ambitious and not less successful work; and 1753, *Ferdinand Count Fathom*, inferior perhaps as a whole, though with a richer variety of amusing, queer, or disgusting folk, and containing scenes of striking adventure and eloquent description. S. next translated *Don Quixote* (1755); in which, it is admitted, he was surpassed by Motteux and Jarvis. He then undertook the editorship of a new tory and high-church journal, *The Critical Review*—the most unfortunate of all his engagements, as it involved him in endless quarrels and personalities: for one article, an attack on Admiral Knowles, he suffered three months' imprisonment, and was fined £100. In 1758 he published his *History of England,* 4 vols. quarto—a history from the descent of Julius Cæsar to the treaty of Aix-la-Chapelle 1748. This work, begun and completed in 14 months, realized for him £2,000. Though superficial and inaccurate, it has passages of fine animated writing and masterly delineation of character. We next find S. in political controversy with Wilkes and others, and defending Lord Bute's administration: but he lacked tact and temper for such work and reaped no laurels as a politician. Another novel appeared 1760–1, *The Adventures of Sir Launcelot Greaves*; two vols. of querulous *Travels in France and Italy* (1766); *The Adventures of an Atom* (1769) a political satire unworthy of its author; and (1771) only afew months before his death, *The Expedition of Humphry Clinker*, the best of all his novels; and in the opinion of Thackeray, one of the very best in the whole range of imaginative literature. Worn out with literary cares, private misfortunes, anxiety, and ill-health, the novelist retired to Italy, and died at Monte Novo, Leghorn.

As a novelist, S. is distinguished by broad humor and burlesque, affluence of incidents and characters, and a singularly easy and picturesque style of narrative. He is often careless, but rarely dull. He does not indulge in digressions, like Fielding; and though less of a literary artist than his great English rival, his works are read with more intense interest: he had, in fact, greater imagination and poetical sensibility than Fielding; and his best qualities have had a wider influence on the English novel. He added largely to the stock of original characters and humorists —Strap, Tom Bowling, Morgan the Welshman, Lismahago, and Matthew Bramble are probably still unsurpassed. Delicacy of taste was neither possessed nor sought by either Fielding or S.; and the latter—as having the more exuberant fancy—may be deemed even the more gross and sensual of the two; he had to apologize for and withdraw some of the most offensive indecencies in his first ed. of *Peregrine Pickle.* Admiration for his abilities might be lost in abomination of his grossness, were not the general coarseness of his times remembered in mitigation.

SMOLT, n. *smōlt* [Scot. *smolt*, a smolt: AS. *smolt,* fat]: a young salmon that has acquired its silver scales, being a little more than a year old: see SALMON.

SMOOTH, a. *smôth* [AS. *smethe,* even, soft; the radical meaning is pliable: Ger. *schmieden*, to forge: Low Ger. *smödig;* Dut. *smijdig*, malleable: Dan. *smidig*, pliable]: having an even or level surface; not rough; sleek; glossy; not ruffled, as water; that flows without stops or difficulty, as words; bland; not harsh; insinuating: V. to make plain or even on the surface; to flatten; to make flowing; to soften; to ease; to render easy; to calm: N. a part free from roughness. SMOOTH'ING, imp. SMOOTHED, pp. *smóthd.* SMOOTH LY, ad. *-lĭ,* without obstruction; easily; with soft and bland language; mildly. SMOOTH'NESS, n. *-nĕs,* the quality or condition of being smooth; freedom from roughness; easy flow of words; blandness in address. SMOOTH-BORE, n. a gun not rifled. SMOOTH-BORED, a. having a smooth surface inside of a gun, as opposed to rifled. SMOOTH-CHINNED, *-chĭnd,* having a smooth chin; beardless. SMOOTH FACED, having a soft or mild look. SMOOTH-PACED, that moves with even paces. SMOOTH-TONGUED, flattering; plausible. SMOOTHING-IRON, a flat piece of iron having a polished face and a handle, which, when heated, is used for smoothing linen; a flat-iron. SMOOTHING-PLANE, a carpenter's tool.—SYN. of 'smooth, a.': plain; even; flat; level; sleek; glossy; polished; soft; mild; bland; soothing; flattering; deceptive; voluble; adulatory;—of 'smooth, v.'. to level; palliate; lessen; soften; calm; mollify; ease; flatter.

SMORZATO, ad. *smŏrd-zâ'tō,* or SMORZAN'DO, ad. *-zăn-tō* [It., dying away]: in *music,* term denoting that the bow of a violin must be drawn its full length, but lightened gradually till the sound is nearly gone: in general, gradual diminution till the sound altogether dies away.

SMOTE, *smōt:* pt. of SMITE, which see.

SMOTHER, v. *smŭth'ér* [AS. *smorian,* to smother: Low Ger. *smaddern,* to meddle with dirty things: Dut. *smodderen,* to dabble, to dirty; *smooren,* to smoke, to suffocate: Scot. *smoor,* to stifle: Gael. *smod,* dust, dirt]: to extinguish life by causing smoke or dust to enter the lungs, or by depriving the lungs of air; to extinguish fire by excluding air; to suffocate; to suppress; to choke; to be suffocated; to be suppressed or concealed: N. in *OE*, that which suffocates; smoke; thick dust. SMOTH'ERING, imp.: ADJ. wanting vent; suffocating. SMOTH'ERED, pp. *-érd:* ADJ. stifled; suppressed. SMOTH'ERINGLY, ad. *-ér-ĭng-lĭ.* SMOTH'ERY, a. *-ĭ,* tending to smother.

SMOULDER, v. *smōl'dér* [Low Ger. *smölen,* to smoulder: Dut. *smeulen,* to burn slowly with a thick smoke: Ir. *smuid,* smoke: Dan. *smul,* dust]: to burn or smoke slowly without flame; to consume away without showing the fire. SMOUL'DERING, imp. *-dér-ĭng:* ADJ. burning in a smothered manner without flame. SMOUL'DERED, pp. *-dérd.* SMOUL'DRY, a. *-drĭ,* in *OE.*, same as SMOULDERING; burning and smoking without flame.

SMUDGE, v. *smŭj* [Dan. *smuds;* Gael. *smod,* dirt, filth; *smuid,* smoke (from SMUT, which see)]: to stain with dirt; to stain or blot; to rub writing when the ink is wet; to blacken with smoke; to confuse the colors in painting: N. a suffocating smoke; a blot; a smear. SMUDG'ING, imp. SMUDGED, pp. *smŭjd.* SMUDGE-COAL, an English miner's term for coal that has been partially converted into a sort of natural coke or impure anthracite—known as *blind-coal.*

SMUG, a. *smŭg* [Ger. *schmuck*, pretty, handsome: Dan. *smuk*, pretty: Low Ger. *smuk*, neat, trim]: spruce; neat; nice; dressed; pert; with affected niceness, but without good taste: V. to adorn; to dress up. SMUG'GING, imp. SMUGGED, pp. *smŭgd*. SMUG'NESS, n. *-nĕs*, the state of being spruce; affected niceness in dress. SMUG-FACED, prim-faced.

SMUGGLE, v. *smŭg'gl* [Dan. *smugle;* Ger. *schmuggeln;* Dut. *smokkelen*, to smuggle: AS. *smugan*, to creep: Icel. *smeygja*, to slip into]: to bring goods into, or carry goods out of, a country secretly in order to escape payment of the legal duties; to convey clandestinely. SMUG'GLING, imp. *-glĭng:* N. the offense of passing goods into or out of a country without paying the legal duties; the act or practice of (see below). SMUG'GLED, pp. and a. *-gld*. SMUG'GLER, n. *-glėr*, one who smuggles; a ship employed in smuggling.

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